RESOURCES, REGULATIONS AND REALITY

REPORT OF THE YUKON PLACER MINING GUIDELINES PUBLIC REVIEW COMMITTEE 1983

IONE CHRISTENSEN - CHAIRPERSON

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AND REALITY

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Chairperson

Ione J. Christensen

Committee Members

I.J. Cable K. Weagle D. Anderson

Whitehorse, Yukon

December 1983

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YUKON PLACER MINING GUIDELINES
PUBLIC REVIEW COMMITTEE

Ione J. Christensen - Chairperson

The Honourable John C. Munro
Minister of Indian Affairs & Northern Developement
OTTAWA, ONTARIO

Sir:

In accordance with the Terms of Reference given to me in March 1983, my committee has held Public Hearings on the document "Yukon Placer Mining Guidelines" - Draft for Discussion purposes. Our Report "Resources, Regulations and Reality", sets out our findings and makes recommendations for change to the Draft Guidelines.

I have been ably assisted in this task by the three committee members who join me in signing this letter of transmittal.

Yours respectfully,

Ione J. Christensen,
Chairperson.

David A. Anderson,

I.J. (Jack) Cable,

Kenneth V. Weagle,
Committee Members.

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YUKON PLACER MINING GUIDELINES PUBLIC REVIEW COMMITTEE

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ACKNOWLEDGEMENTS

When the Committee was first appointed a reporting period of 90 days was anticipated. Here we are, nine months later, putting the finishing touches on a rather comprehensive review. The task has never been easy, but the help and co-operation received from so many groups and individuals has made it seem easier and worth the effort.

We would like to recognize and express our sincere thanks to:

The members of the ICPM and their staff
The executive of the KPMA
The staff at the Chamber of Mines
The executive of the Conservation Society
The Government of the Yukon Territory
All other Registered Interveners
Members of the public who took the time to attend the hearings and express their concerns.

During the life of the Committee a number of contracts with local businesses were initiated. The services received were excellent. We would especially like to single out J.G. Moore and Associates who provided the transcription service. Their staff put in very long hours when the Chairperson extended scheduled time so that everyone could be heard. Their co-operation and competence was appreciated.

Members of the Committee wish to express their gratitude to our support staff, the Executive Secretary Mr. Dermot Flynn, who co-ordinated the administration and logistical work, acted as a resource officer and put in endless hours of drafting on the report. From May until August he was assisted by the Clerk Typist Mrs. Jean Dell and from August until December by Mrs. Sherri Walton, both of whom were extremely diligent and competent.

Most Committee's who undertake a task such as ours have a considerably larger support staff. It has only been through the total dedication and the quality of our small team that so much has been accomplished.

In conclusion I would like to commend the Ministers and the Government of the Yukon for the excellent choice of members to this Committee. At no time during the life of the Committee were there disagreements on the objectives we wished to achieve. The process by which these recommendations were developed was an extremely positive one, and it made my job as Chairperson most rewarding.

December, 1983.

EXECUTIVE SUMMARY

In March of 1983 the Minister of Indian Affairs and Northern Development established the Yukon Placer Mining Guidelines Public Review Committee. It was instructed to hold public hearings to review the proposed draft guidelines for the Yukon placer mining industry and to report its findings and make recommendations to the Minister of Indian Affairs and Northern Development and through him to the Ministers of Fisheries and Oceans and of the Environment.

The Committee held public hearings for fifteen days between September 7th and November 8th, 1983. Eight days of hearings were held in Whitehorse and seven days of hearings were held in the major placer mining areas of the Yukon.

The Government of Canada was represented at these hearings by the Interdepartmental Committee on Placer Mining (ICPM) which was comprised of senior officials from the three federal departments which jointly prepared the proposed Yukon Placer Mining Guidelines. The ICPM participated in the public hearings in the role of the proponent.

Other major participants in the hearings included the Government of Yukon, the Klondike Placer Miners Association and the Yukon Conservation Society.

The Committee invited and heard comment from virtually every interest group in the Yukon that could have reasonably been expected to have had an interest in placer mining and environmental issues. Over one hundred and fifty presentations and submissions were received and fifteen volumes and three thousand seven hundred pages of verbatim transcripts were recorded.

The Committee's Review of the Proposed Guidelines

The Committee reviewed the proposed Yukon Placer Mining Guidelines and the four subject areas discussed in the background papers to these guidelines. These four subjects were the stream classification system, effluent standards, the attainment and cost of placer mining effluent guidelines, and the socio-economic analyses.

Stream Classification System

The evidence that the Committee heard about the stream classification system was based on the background paper A Rationale for the Classification of Rivers, Streams and Lakes in the Yukon Territory in Relationship to the Placer Mining Guidelines. This paper explains how the classification of streams, rivers, and lakes was developed and how the classification system would fit into the matrix of the A,B,C and D streams as outlined in the guidelines.

There were two major criticisms of the stream classification system. Mining interests contended that the system was based on incomplete data and conservation interests criticized the system because it, for the most part, only dealt with the fisheries resource.

The Committee concluded that, in principle, the stream classification system is sound. The criticisms of it were valid, however, they were by no means fatal to the system.

Effluent Standards

The evidence on this subject was based on the background paper A Rationale for the Suspended Solids Standards for Yukon Streams Subject to Placer Mining. This paper presents a detailed review of the impacts of sediment on primary producers, stream invertebrates, and fish and proposes maximum sediment discharge standards for each stream classification.

The Committee heard considerable comment from the public about the effects of placer mining effluent on fish and fish habitat. Many of those who appeared before the Committee simply could not accept the ICPM's position that sediment is a major pollutant; however, no scientific analysis or opinion was put forward to refute this position.

The Committee found the ICPM's presentation on the subject of suspended solids and effluent standards to be convincing and is of the opinion that the proposed effluent standards are appropriate for the protection of fish and fish habitat. The Committee, therefore, accepts in principle, the ICPM's presentation on the effect of sediment on fish and fish habitat and the rationale for the proposed effluent standards.

Attainment and Cost of Placer Mining Effluent Guidelines

In the background paper The Attainment and Cost of Placer Mining Effluent Guidelines the Government proposes ways by which placer miners may be able to meet the effluent standards of the proposed guidelines.

This subject raised some of the most intense debate during the hearings. Miners contended that the effluent standards required by the proposed guidelines were not attainable at

an economic cost, or, in some cases, at any cost. They were also very critical of the cost estimates prepared by the ICPM and presented their own estimate of what it would cost to meet the effluent standards. These estimates were remarkably different from those presented by the ICPM. The Committee was unable to resolve which estimates were the more credible.

The question of the cost and attainability of the effluent standards raises some very serious doubts in the minds of Committee members. These doubts are centered on four points; the feasibility of meeting the standards; the risk that some existing investment in the industry may be abandoned; the broader question of what is the purpose of these standards and is the cost of achieving that purpose worth it; and concerns about who should bear the costs associated with the change in the regulatory regime and whether there should be compensation for those who must abandon their investment.

These concerns have convinced the Committee that the existing industry should receive special treatment under any new regulatory regime.

Socio-economic Analyses

The Committee reviewed four socio-economic analyses on the Yukon Placer Mining Guidelines. Two of these analyses were prepared for the ICPM, one was prepared for the Klondike Placer Miners Association, and the other was prepared for the Yukon Conservation Society.

These analyses provided remarkably different conclusions. Estimates of the number of operators that would cease to mine because they could not comply with the guidelines varied from 16% to 85%. Benefit-cost ratios varied from .03 to 1.55.

The Committee was not able to assess the relative credibility of these analyses and, therefore, is not prepared to draw any precise conclusions from them. However, it can make one categorical conclusion - the economic analyses presented should not be looked upon as being decisive in making what is unavoidably a political decision.

The Guidelines

The Committee reviewed four specific provisions of the proposed guidelines - the development plan; rehabilitation; diversions; and leave strips. These provisions are not dealt with in the background papers.

The Committee found that the concept of a development plan was generally supported by the public. There were concerns expressed about the scope of the information and the level of detail that might have to be provided in a development plan. The Committee shares some of these concerns. Nevertheless, the Committee believes that the requirement of a development plan is sound and reasonable.

The Committee found general acceptance of the need for rehabilitation of mined areas and of the general principles of the provisions of the proposed guidelines relating to rehabilitation. Concerns were expressed about the ability of miners to post the required financial security, the miners' responsibility for rehabilitating the past workings of other miners and about whether rehabilitation should be progressive with the operational phase of mining.

The Committee is not convinced that all areas should be rehabilitated. In some areas the results may simply not justify the efforts. However, in new mining areas and areas of high biological importance no consideration should override provisions for rehabilitation.

Diversions are constructed by miners to divert water away from existing stream beds so that these beds and the area around them may be mined. The guidelines prohibit diversions on A and B streams and set standards for their design and construction on C, D and X streams. In principle, the Committee supports the rationale for the provision governing diversions, however, the Committee has some concerns about whether or not it is worth it to incur the costs of meeting these standards.

The guidelines require leave strips on A, B and C streams. They were discussed briefly during the hearings and a number of interveners remarked on them in their written presentations. The concern over leave strips was that they would limit the miner's ability to exploit all of the gold reserves on his property.

The evidence that the ICPM presented on this subject was not convincing and the Committee, therefore, has some reservations about the need for and the reasonableness of this requirement.

RECOMMENDATIONS

Introduction

The Committee recommendations on the proposed guidelines are aimed at achieving three objectives. First, providing miners and public officials with legal certainty. Second, protecting existing investment. Third, the placer mining industry must be brought under a regulatory regime that is consistent with the nature and scope of environmental regulations that are applicable to other industries.

The following are the Committee's key recommendations:

Legal and Policy Issues

The Committee recommends:

i) That as an interim measure, exemption should immediately be provided through regulations of the Fisheries Act and/or the Northern Inland Waters Act to allow placer miners to carry out established industry practices - most particularly, the returning of sluice water (deleterious substances/waste),at specified effluent standards to the water bodies from which they were obtained.

ii) That in the longer term a thorough review of all legislation governing placer mining should be undertaken with the objective of making their application to the industry consistent, each with the other.

Yukon Territory Water Board to Act as the One Window

The Committee recommends:

i) That the Yukon Territory Water Board be charged with the sole responsibility of issuing water use authorizations and/or licences for all placer mining operations.

ii) That the necessary changes to the regulations of the Fisheries Act and/or the Northern Inland Waters Act,as recommended above,be implemented to permit the Yukon Territory Water Board to take on these responsibilities.

Exemption Under Grandfather Clauses for Existing Operators

The Committee recommends:

i) That existing operators be exempted under appropriate grandfather clauses from any regulatory regime that would give effect to the proposed guidelines.

ii) That the exemption under such grandfather clauses be enjoyed for twelve years; be applicable to the property itself; and be transferable.

iii) That the proposed guidelines, as amended herein, be applicable to existing operators, irrespective of exemption under grandfather clauses, where the operation is located on an A or B stream and where the presence of salmon is proven.

iv) That those existing operators on A and B streams that must comply with the proposed guidelines as amended be financially assisted to help them meet the standards, or financially compensated if they cannot reasonably and economically meet the standards.

v) That no operator that is afforded exemption under grandfather clauses be allowed to do less than what is required by the 1975 guidelines or the terms of his most recent water use licence or authorization to use water.

New Operators

The Committee recommends that new operators should be subject to a regulatory regime that incorporates the standards and provisions of the proposed guidelines, as amended in this report.

Stream Classification

The Committee recommends:

i) That revisions to the stream classification system should be made so that the emphasis of the system is on proven resource values rather than on potential resource values.

ii) That all information used to assign a classification to any water body should be readily available to the public.

iii) That it should be the responsibility of the Department of Fisheries and Oceans to gather the baseline data necessary for assigning or altering the classification of any area or stream that is now being mined. In areas and on streams that have not been mined the responsibility for gathering such data should rest with the developer.

Effluent Standards

The Committee recommends:

i) That the effluent standards on A and B streams should be no discharge and 100 mg/l above background respectively.

ii) That on all other streams the standard should be 1,000 mg/l above background.

iii) That on those streams that flow directly into A and B streams there should be a water quality objective of 100 mg/l above background at the point of entry.

iv) That communal settling ponds should be permitted in areas where their use would be feasible.

Development Plan

The Committee recommends:

i) That a development plan should be required for every water use application for the purposes of placer mining.

ii) That Government, in consultation with the industry, should develop model development plans which can be used by industry members as a guide to estimate the cost of and prepare their plans.

iii) That the scope of the information required in the development plan should be directly related to the biological sensitivity and the past mining history of the area in which the placer workings is to be located, and to the size of the operation as determined by volume of water used and volumes of material disturbed. The more sensitive the area and the larger the proposed workings, the greater should be the scope of the development plan. The more extensive the past mining history of the placer workings and/or its surrounding area, the lesser should be the scope of the development plan.

Rehabilitation

The Committee recommends:

i) That where practicable, rehabilitation should be progressive with the operational phase of the placer workings.

ii) That where progressive rehabilitation is not practicable interim measures which will facilitate future rehabilitation should be undertaken.

iii) That some form of financial security should be required to ensure that rehabilitation is carried out. The amount of the financial security should be related to the amount of ground that is to be disturbed, the past performance of the operator, and the proposed schedule of rehabilitation.

iv) That the scope of the rehabilitation work to be carried out by the operator should be related to the historic importance of the area, its biological sensitivity, the natural stability of the area, whether it is likely to be mined again, and the extent of previous mining activity on the property.

Diversions

The Committee recommends:

i) That diversions should be permitted at times of no or limited fish presence during the season on A and B streams where it is feasible to undertake appropriate mitigative measures to protect salmon and salmon habitat.

ii) That in such cases where diversions are to be constructed on A and B streams the onus shall be on the operator to prove that the proposed mitigative measures will provide an acceptable level of protection.

iii) That standards for diversions on other streams appear to be excessive, and should be modified accordingly.

Leave Strips

The Committee recommends that leave strips should only be required on A and B streams where the presence of the salmon resource has been proven and where the Department of Fisheries and Oceans can demonstrate the need for leave strips on a site specific basis.

In conclusion the Committee recommends:

i) That the Report of the Yukon Placer Mining Guidelines Public Review Committee be immediately released to the public.

ii) That all matters addressed by these recommendations be dealt with as expeditiously as possible. The industry and public officials have worked under uncertainty for far too long.

Résumé

C'est en mars 1983 que le ministre des Affaires indiennes et du Nord canadien a institué le Comité d'examen des directives sur l'exploitation des placers au Yukon. Le Comité avait pour mandat de tenir des audiences publiques afin d'étudier les directives proposées pour l'exploitation des placers au Yukon, de faire rapport de ses constatations et de formuler des recommandations au ministre des Affaires indiennes et du Nord canadien et, par son intermédiaire, au ministre des Pêches et des Océans et à celui de l'Environnement.

Le Comité a tenu des audiences publiques pendant quinze jours du 7 septembre au 8 novembre 1983. Huit de ces journées ont eu lieu à Whitehorse et les sept autres, dans les principaux secteurs d'exploitation des placers au Yukon.

Le gouvernement du Canada était représenté à ces audiences par le Comité interministériel de l'exploitation des placers (CIEP), constitué de hauts fonctionnaires des trois ministères fédéraux qui ont travaillé au projet de directives sur l'exploitation des placers au Yukon. Le CIEP a assisté aux audiences publiques à titre de défenseur de la cause.

Parmi les principaux participants, on comptait le gouvernement du Yukon, la Klondike Placer Miners Association et la Yukon Conservation Society.

Le Comité a sollicité et entendu les opinions de presque tous les groupes particuliers du Yukon qui pourraient avoir quelque intérêt au chapitre de l'environnement et de l'exploitation des placers. Plus de 150 présentations et mémoires ont été soumis; de plus, 15 volumes et 3 750 pages de transcription de textes ont été enregistrés.

Examen des directives par le Comité

Le Comité a étudié le projet de directives sur l'exploitation des placers au Yukon et les quatre sujets soulevés dans les dossiers d'information complémentaires. Il s'agit entre autres, du système de classification des cours d'eau, des normes relatives aux effluents, de l'application des lignes directrices sur les effluents et les coûts qui y sont reliés, ainsi que des analyses socio-économiques.

Systéme de classification des cours d'eau

Les témoignages entendus à ce sujet étaient fondés sur le dossier d'information intitulé A Rationale for the Classification of Rivers, Streams and Lakes in the Yukon Territory in Relationship to the Placer Mining Guidelines. Ce document décrit l'élaboration du système de classification des cours d'eau, des rivières et des lacs. Il explique comment ce système s'intégrerait dans le modèle proposé de classement des cours d'eau en catégories A,B,C et D, tel que décrit dans les directives.

Deux grandes critiques furent cependant formulées. Les sociétés minières prétendaient que le système reposait sur des données incomplètes et les partisans de la conservation reprochaient par ailleurs à ce système de traiter surtout de la pêche.

Le Comité a conclu que cette méthode de classification était en principe valable. Les critiques à cet égard étaient fondées mais ne pouvaient avoir aucune conséquence fatale pour le système.

Normes relatives aux effluents

Les témoignages entendus sur cette question reposaient sur le dossier d'information intitulé A Rationale for the Suspended Solids Standards for Yukon Streams Subject to Placer Mining. Ce document présente un examen approfondi des répercussions du mouvement des sédiments sur les producteurs primaires, les invertébrés des cours d'eau et les poissons. Il propose des normes maxima de débit solide pour chaque catégorie de cours d'eau.

Le Comité a entendu de nombreux commentaires de la part du public au sujet des conséquences sur le poisson et son habitat, des effluents provenant de l'exploitation des placers. Bon nomber des personnes qui se sont présentées au Comité ne pouvaient simplement pas accepter le point de vue du CIEP: les sédiments sont un important agent de pollution; cependant, aucune analyse ou opinion scientifique ne fut avancée pour réfuter cette opinion.

Le Comité a jugé convaincante la présentation du CIEP portant sur les normes relatives aux effluents et aux matières solides en suspension. Il estime que les normes proposées pour les effluents sont adéquates pour la protection du poisson et de son habitat. Le Comité accepte donc en principe la présentation du CIEP sur les répercussions du mouvement des sédiments sur le poisson et son habitat ainsi que la justification des normes proposées.

Application et coûts des directives sur les effluents

Dans le dossier d'information intitulé The Attainment and Cost of Placer Mining Effluent Guidelines, le gouvernement propose aux exploitants de placers les moyens de respecter les normes relatives aux effluents.

Cetter question a soulevé de vives discussions du cours des audiences. Les exploitants soutiennent que les normes qui seraient imposées ne peuvent être appliquées à un coût rentable ou, en certains cas, à quelque coût que ce soit. Ils se sont aussi élevés contre les prévisions de coûts préparées par le CIEP et ont soumis leurs propres estimations au chapitre de l'application des normes relatives aux effluents. Leurs prévisions différaient complètement de celles du CIEP. Le Comité n'a pu déterminer la plus valable de ces estimations.

La question de l'application des normes relatives aux effluents et celle des coûts soulèvent de très sérieux doutes dans l'esprit des membres du Comité. Ces doutes reposent sur quatre points;la faisabilité de l'application des normes; le risque d'abandon par l'industrie de certains investissements actuels; l'objectif de l'application de ces normes et le coût de la réalisation de cet objectif; enfin la question de savoir qui devrait assumer les coûts reliés au changement des règlements et indemniser les exploitants qui doivent renoncer à leurs investissements.

Ces sujets de préoccupation ont convaincu le Comité qu'il faudrait accorder une place particulière à l'industrie actuelle, au terme de toute nouvelle réglementation.

Analyses socio-économiques

Le Comité a étudié quatre analyses socio-économiques portant sur les directives sur l'exploitation des placers au Yukon. Le CIEP a préparé deux de ces analyses, la Klondike Placer Miners Association en a préparé une et la Yukon Conservation Society a préparé l'autre.

Ces analyses ont permis de tirer des conclusions très différentes. Les prévisions portant sur le nombre d'exploitants, que cesseraient leurs activitiés faute de ne pouvoir se conformer aux directives, variaient de 16 p. 100 à 85 p. 100. Les rapports coûts-bénéfices variaient aussi de 0,03 à 1,55.

Le Comité n'a pas pu évaluer la crédibilité de ces analyses et n'est donc pas en mesure d'en tirer des conclusions précises. Cependant, il peut affirmer avec certitude qu'il ne faudrait pas considérer ces analyses comme concluantes lorsque viendra le moment de prendre ce qui sera inévitablement une décision politique.

Directives

Le Comité a étudié quatre dispositions particulières des directives proposées: le plan de mise en valeur; la remise des lieux à l'état naturel; les détournements de cours d'eau et les bandes protectrices. Les dossiers d'information n'abordent pas ces questions.

Le Comité a observé que le concept d'un plan de mise en valeur était, en général, bien acueilli du public. Des inquiétudes ont été exprimées quant à la portée de l'information et au degré de précision que devrait avoir le plan de mise en valeur. Le Comité partage certaines de ces inquiétudes. Neanmoins, il estime que la besoin d'un tel plan est logique et raisonnable.

Le Comité a constaté qu'on reconnaissait, dans l' ensemble, le besoin de remettre en état les secteurs exploités et qu'on acceptait les grandes lignes des dispositions de ces directives au chapitre de la remise des lieux à l'état naturel. Des inquiétudes ont été exprimées au sujet des point suivants; la

capacité des exploitants à fournir les garanties financières requises, la responsabilité des exploitants à l'égard de la remise à l'état naturel des lieux antérieurement exploités par d'autres sociétés, et l'opportunité de remettre les lieux en état au cours de la mise en valeur.

Le Comité n'est pas convaincu de la nécessité de ce retour à l'état naturel pour tous les secteurs exploités. Dans certaines régions, les résultats pourraient bien ne pas justifier les efforts. Cependant, dans les nouvelles zones d'exploitation, et dans les zones d'une grande importance biologique, aucune considération ne devrait l'emporter sur les dispositions relatives à la remise des lieux à l'état naturel.

Les dérivations sont construites par les sociétés pour détourner les cours d'eau, afin de pouvoir exploiter les dépôts et les alentours. Les directives interdisent les détournements de cours d'eau des catégories A et B; elles fixent aussi des normes de conception et de construction pour les catégories C,D et X. En principe, le Comité accepte les motifs des dispositions relatives aux détournements mais il se demande si l'application de ces normes justifie de telles dépenses.

Les directives requièrent des exploitants qu'ils laissent des bandes protectrices le long des cours d'eau des catégories A,B et C. Il en fut brièvement question au cours des audiences et quelques intervenants ont souligné ce sujet dans leurs présentations écrites. Malgré tout, les bandes protectrices empêcheraient certains d'extraire toutes les réserves d'or de leur propriété.

Comme les preuves du CIEP n'étaient pas convaincantes, le Comité a fait certaines réserves quant à la nécessité et à la justesse de cetter condition.

Recommandations

Introduction

Les recommandations du Comité portant sur les directives proposées visent trois objectifs. En premier lieu, il s'agit de fournir aux exploitants et aux autorités publiques une certitude sur le plan légal. Il s'agit aussi de protéger les investissements actuels. Enfin, l'industrie de l'exploitation des placers doit se plier à une réglementation conforme à la nature et à la portée des règlements environnementaux en vigueur pour d'autres industries. Voici les principales recommandations du Comité:

Questions juridiques et politiques

Le Comité recommande:

(i) d'accorder immédiatement à titre de mesure provisoire, une exemption en vertu des règlements de la Loi sur les pêcheries ou de la Loi sur les eaux intérieures du Nord et ce, pour permettre aux exploitants de poursuivre les méthodes habituelles de travail entre autres, de renvoyer les eaux des rigoles (substances délétères et déchets) dans les cours d'eau d'où elles ont été puisées, en s'assurant que leur débit est conforme aux normes sur les effluents;

(ii) de mener ultérieurement une étude complète de la législation régissant l'exploitation des placers, afin de l'appliquer à l'industrie de façon cohérente et logique.

Rôle de la Régie des eaux de Yukon

Le Comité recommande:

(i) de charger la Régie des eaux du Yukon de l'émission des permis d'utilisation des eaux ou des licences pour toutes les activités d'exploitation des placers;

(ii) d'apporter les modifications nécessaires aux règlements de la Loi sur les pêcheries et de la Loi sur les eaux intérieures du Nord, comme il a été recommandé précédemment, et de permettre à la Régie des eaux du Yukon d'assumer seule cette responsabilité.

Exemption des exploitants actuels en vertu de dispositions de première génération

Le Comité recommande:

(i) d'exempter les exploitants actuels et ce, en vertu des dispositions de première génération, de toute réglementation relative à l'application des directives proposées;

(ii) d'accorder une exemption au titre de ces dicpositions de première génération pour une période de douze ans. Il faut que cette exemption s'applique à la propriété même et qu'elle soit transmissible;

(iii) d'appliquer les directives proposées et modifiées comme prévu, aux exploitants actuels, sans égard à l'exemption au titre des dispositions de première génération, lorsque l'exploitation est située sur un cours d'eau de catégorie A ou B et lorsque la présence du saumon a été établie;

(iv) de verser aux exploitants actuels de cours d'eau (catégories A et B) se conformant aux directives proposées et modifiées, une subvention pour les aider à respecter les normes ou de verser une indemnité financière s'ils ne peuvent respecter ces normes de manière raisonnable et économique;

(v) de n'accorder à aucun exploitant jouissant de l'exemption au titre des dispositions de première génération, le droit d'exploiter dans des conditions inférieures à ce que requièrent les directives de 1975, ou les conditions attachées au plus récent permis ou licence d'utilisation des eaux.

Nouveaux exploitants

Le Comité recommande de soumettre les nouveaux exploitants à la réglementation qui comprendra les normes et les dispositions des directives proposées et modifiées selon le présent rapport.

Classification des cours d'eau

Le Comité recommande:

(i) de procéder à une révision du système de classification des cours d'eau de façcon que ce système accorde plus d'importance à la valeur prouvée des ressources qu'à leur valeur éventuelle;

(ii) de mettre à la disposition de public toutes les données servant à établir la catégorie de tout cours d'eau;

(iii) de charger le ministère des Pêches et des Océans de veiller à la collecte des données de base nécessaires à la claaification ou à la modification de la classification de toute région ou de tout cours d'eau actuellement exploité. Dans le cas des régions et des cours d'eau non encore exploités, la cueillette de ces données devrait être faite par l'exploitant.

Normes relatives aux effluents

Le Comité recommande:

(i) conformément aux normes relatives aux effluents et visant les cours d'eau des catégories A et B, d'interdire les déversements dans le premier cas, et de permettre un déversement de 100 mg/l dans le second;

(ii) lors d'un déversement, de ne pas excéder 1000 mg/l au-delà du niveau naturel, dans toutes les autres catégories de cours d'eau;

(iii) d'adopter au point de confluence pour les cours d'eau se jetant directement dans les cours d'eau de catégories A et B, la norme de qualité d'eau de 100 mg/l au-delà du niveau naturel;

(iv) de permettre l'utilisation des bassins décanteurs publics dans les régions où ils peuvent être aménagés.

Plan de mise en valeur

Le Comité recommande:

(i) de joindre un plan de mise en valeur, à toute demande d'utilisation des eaux aux fins d'exploitation des placers;

(ii) d'élaborer en accord avec l'industrie, un dodèle of ficiel de plan de mise en valeur qui pourrait servir de guide au secteur privé afin de prévoir les coûts et de préparer des plans;

(iii) de relier directement la portée de l'information requise dans le plan de mise en valeur à la fragilité du milieu biologique et à l'histoire de l'industrie minière de la région où les installations seront situées; de relier aussi l'importance de l'opération établie au volume d'eau utilisé et au volume de matières déplacées. La portée du plan de mise en valeur est fonction de la fragilité de la région et de la taille des installations. Elle est aussi fonction de l'histoire de l'industrie minière dans le secteur choisi et les environs.

Remise des lieux à l'état naturel

Le Comité recommande:

(i) de remettre les lieux à l'état naturel dans la mesure du possible et ce, tout as cours de l'exploitation des placers;

(ii) de prendre des mesures provisoires pour faciliter la remise en état, lorsque cette opération ne peut se fair progressivement;

(iii) d'exiger des garanties financières pour assurer la remise des lieux à l'état naturel, Le montant de la garantie financière devrait être fonction du volume de terre qui sera déplacé, des activités antérieures de l'exploitant et du calendrier proposé de remise en état;

(iv) de relier l'étendue des travaux prévus de remise en état à l'importance historique de la région, à la fragilité du milieu biologique, à la stabilité naturelle, à la probabilité d'exploitation du secteur, enfin à l'importance des travaux antérieurs dans la propriété.

Détournements de cours d'eau

Le Comité recommande:

(i) de permettre des détournements de cours d'eau en des périodes d'absence de poisson ou de présence limitée de poisson durant la saison, dans les cours d'eau des catégories A et B et ce, lorequ'il est possible de prendre des mesures particulières pour protéger le saumon et son habitat;

(ii) d'exiger auprès de l'exploitant dans les cas d'aménagement de dérivations sur les cours d'eau catégories A et B, la preuve que les mesures proposées garantiront une protection acceptable;

(iii) Le comité estime que les normes de détournement pour les autres cours d'eau sont excessives et qu'elles devraient être modifiées en conséquence.

Bandes protectrices

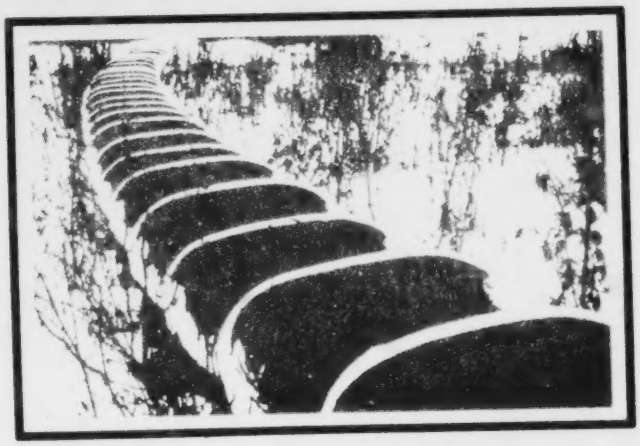
Le Comite recommande l'établissement de bandes protectrices our les cours d'eau des catégories A et B, lorsque la présence de saumon est prouvée et que le ministère des Pêcheries et des Océans peut démontrer la nécessité de bandes semblables pour chaque emplacement.

En conclusion, le Comité recommande:

(i) de diffuser immédiatement le rapport du Comité d'examen des directives sur l'exploitation des placers au Yukon;

(ii) de régler aussi rapidement que possible toutes les questions soulevées par ces recommandations. Les secteurs privé et public travaillent depuis déjà bien trop longtemps dan l'incertitude.

PART 1
THE COMMITTEE



1. COMMITTEE TERMS OF REFERENCE

The Honourable John Munro, Minister of Indian Affairs and Northern Development, announced the appointment of Mrs. Ione J. Christensen, as Chairperson of the Yukon Placer Mining Guidelines Public Review Committee in March of 1983. Mrs. Christensen conducted a public review of new draft environmental guidelines proposed for the Yukon placer mining industry. This review was in keeping with a committment the Department had made to the Yukon mining industry that any proposed guidelines would be the subject of a public review process.

The Terms of Reference of the Committee directed the Chairperson to conduct public hearings on the proposed draft guidelines and to prepare a report for submission to the Minister of Indian Affairs and Northern Development and through him to the Ministers of Fisheries and Oceans and Environment. More specifically, the Terms of Reference directed that the Chairperson's report address the following:

- the principle concerns of various interest groups;
- the difficulties industry and other special interest groups anticipate if the proposed draft guidelines are promulgated and implemented without further amendment. The report should consider socio-economic considerations;
- recommendations for revision to the draft guidelines with appropriate reasons;
- recommendations regarding the implementation schedule and other matters as may be pertinent.

The complete text of the Terms of Reference appear as Appendix A

To assist the Chairperson the Minister appointed three members to the Committee: Mr. Ken Weagle, an environmental consultant from Whitehorse, Yukon on the recommendation of the Government of Yukon; Mr. I.J. (Jack) Cable, a partner in the Whitehorse law firm of Cable, Veale, Cosco and Morris; and Mr. David Anderson, a professor from the School of Public Administration at the University of Victoria, Victoria, B.C. who was appointed on the recommendation of the Minister of Fisheries and Oceans.

After consultation with representatives of the Yukon mining industry a schedule of public hearings was set for June and July of 1983. At the request of the Klondike Placer Miners Association and other interveners this schedule was cancelled and the hearings were then rescheduled for September 1983.

The Committee held public hearings for fifteen days between September 7th and November 8th. Eight days of hearings were conducted in Whitehorse to hear technical presentations, presentations from registered interveners and concerned members of the public. The Committee visited the major placer mining areas of the Yukon and held seven days of hearings in the communities of Dawson City, Mayo, Destruction Bay, and Carmacks.

The Committee invited and heard comment from virtually every interest group in the Yukon that could have reasonably been expected to have had an interest in placer mining and environmental issues.

Twenty-seven groups, organizations and individuals were registered as official interveners. In addition the Committee heard presentations from over 100 other groups

and individuals (See Appendix C). Another fifteen submissions were mailed directly to the Committee Office.

The Committee listened to concerns expressed by representatives of the mining industry, government, conservation groups, elected representatives, the service industry, prospectors, large and small placer mine operators and many others from virtually all walks of Yukon life.

The Government of Canada's position was presented by the Interdepartmental Committee on Placer Mining (ICPM) which was comprised of senior officials from the three federal departments under whose direction the proposed draft guidelines for Yukon placer mining industry and the accompanying background papers were developed. These three federal departments were the Departments of Indian Affairs and Northern Development, Fisheries and Oceans, and the Environment.

The ICPM participated in the public hearings in the role of the "proponent". Five presentations were made on the proposed draft guidelines and the background papers during the technical sessions in Whitehorse. Brief outline presentations were made in each of the other communities.

The Yukon Government participated fully in the review process. In addition to its official position paper the Government Leader and Cabinet Ministers made individual presentations to the Committee. Two of the Cabinet Ministers also addressed the Committee in their capacity as Members of the Legislative Assembly in their constituencies - Klondike (Dawson City), and Tatchum (Carmacks).

The MLA for Kluane appeared before the Committee in Destruction Bay.

The Yukon's mining industry, and particularly the placer mining industry, was represented principally by the Klondike Placer Miners Association (KPMA). The Committee also heard from the Yukon Chamber of Mines, from private mine operators, and from prospectors.

Representations from suppliers to mining and other business interests, included equipment and machinery dealers, fuel companies, camp supply wholesalers, the Yukon Transportation Association, and the Whitehorse Chamber of Commerce.

Conservation interests were represented most notably by the Yukon Conservation Society. The Committee also heard from the Yukon Association of Wilderness Guides and the Yukon Voyageurs Canoe and Kayak Club.

Little comment on the proposed guidelines was heard from the Yukon Fishing Industry. One commercial fisherman appeared before the Committee in Dawson City and one from Teslin had his presentation read into the record. This was a disappointment to the Committee as many of the significant issues raised during the course of the hearings have a direct bearing on this industry. It would have been helpful to have heard more from this group and to have had the opportunity to discuss thier concerns.

Similarly, the Committee would like to have heard more presentations by the Yukon's Indian people as many of their issues had a direct bearing on significant elements of Yukon Indian lifestyles. The Mayo Indian Band appeared before the Committee, that however, was the extent of any official participation on behalf of Yukon Indian people.

In all the Committee received over one hundred and fifty presentations and submissions and recorded fifteen volumes and almost three thousand seven hundred pages of verbatim transcripts.

Prior to the scheduled June hearings, the Committee drew up a set of Rules and Procedures for the orderly conduct of the hearings. A meeting was called for all registered interveners to review the process and as a result several changes were made (See Appendix B).

It must be noted that the format used, as prescribed by the Terms of Reference was not seen by some of the principle interveners as the best method for extracting all the necessary information. A more formal process was preferred under the Inquiries Act which would have allowed witnesses to be called, sworn, and cross-examined. They argued that technical evidence may have been more conclusive.

The public hearing process followed has produced ample information for the political and policy decision making process. Members of the public felt comfortable in presenting their views and all sittings were well attended (Appendix C). A formal technical session may conceivably be a next step to gather additional technical data, but the Committee is satisfied that by having the informal public hearings first, the right priorities were adopted, and the right questions addressed. It was agreed even by those who would have preferred a more formal process that the hearings were very successful and accomplished what they set out to do.

PART II
OVERVIEW

2. PLACER MINING: A WAY OF LIFE

Placer Mining is more than an industry in the Yukon, it symbolizes the Territory's way of life, its culture, and its roots. It is the base upon which twentieth century Yukon was built.

Placer mining is so entrenched in our northern society that it is seen as a right. A last frontier freedom, for all those who have gradually retreated from regulation and government control in other parts of Canada, United States and Europe. Their last stand, if you will.

If there is one thing which dominates all Yukon society, it is the strong individualism of spirit. All three levels of government - municipal, territorial and federal - are confronted by it and none are able to meet its needs adequately. The Federal Government is the easiest target as it is seen as being from "outside", not knowing, nor being sensitive to local needs. This is misleading for local government, if it is fairly representing the strong conflicting interests, will ultimately face the same scathing reviews.

During our hearings, when listening to presentations, you could easily have concluded that the placer mining industry is now, and has always been, alive and well - fluctuating only with the price of gold or the presence of gold on any one operating claim. You would also know that the placer miner has the right to undertake high risk, to make money or go broke without undue regulation or government interference. However, such an approach is too simplistic and very partisan. It ignores the history of the industry - it ignores the responsibility to others for the use of public lands - it ignores the tenet that our natural resources are not free for the taking.

From the start of the 1898 Gold Rush until the present day, the federal government all but ignored the management of the Yukon fisheries resource. It now recognizes the need for action and is trying to rectify 85 years of neglect in the quickest way possible, namely by placing strict water quality controls on the placer mining industry. The costs of this program to the placer mining industry, which is not large in terms of the area of the Yukon, nor of the total numbers employed in the industry, are substantial. It should be noted, however, that the miner can see no corresponding expenditure elsewhere on salmonid enhancement, through habitat improvement for example, which might well result in an even greater improvement in salmonid stocks on a dollar for dollar basis, than the expenditures his industry is being asked to make.

In order to assess and make recommendations one must objectively review Yukon history.

The Yukon fishery has been in use for hundreds of years by the aboriginal people of this area and formed a vital part of their diet. In "Prelude to Bonanza", By A. Wright, an account by Ogilvie written in August of 1887, describing the Trundeck (Klondike) River, he said:

> "it is a small river about 40 yards wide at the mouth, and shallow: the water is clear and transparent, and of beautiful blue colour. The Indians catch great numbers of salmon here. They had been fishing shortly before my arrival and the river, for some distance up, was full of salmon traps.".

The first gold prospects in the Yukon are assumed to have been made by Russians in the early seventeen hundreds, however, the Indians were placer mining copper nuggets in the headwaters of the White River long before that. The fur

trade, not gold was what inspired Admiral Sir John Franklin and later Robert Campbell to explore the watersheds of the Yukon. Campbell reported finding gold at Fort Selkirk in 1850 and from that time on, until the strike of 1897, drifters from the California and Cariboo Gold Fields filtered north seeking new finds.

North America was suffering a severe depression in 1898 and the Klondike Bonanza promised hope and a new beginning for many unemployed. My Great Grandfather and his four sons were typical of the '98 stampeders. They left St. Johns, New Brunswick in January of 1898 and arrived in Dyea, Alaska in late February. They worked as packers on the Chilkoot Trail until March and then moved on to Lake Bennett building a scow for the trip to Dawson. They arrived in May and headed for the creeks. Like many others they found all of the good ground taken, but they staked a small claim on twenty-one above Bonanza and the next year at six above Hunker. Because the costs of bringing machinery north was so prohibitive all mining was labour intensive. Underground shafts were sunk during the winter, the gravels brought up by hand windlasses and the gold recovered through sluicing during the early spring runoff.

Regulations governing the staking of placer claims had been in place before the August 17, 1896 discovery, but there was little or no provision for the granting of applications for licencing, franchises, or concessions. In January of 1898 Clifford Siffton, the Minister of Interior in Ottawa, granted the first concession, lease Number 1, to a Mr. Anderson to mine on a large scale with machinery. This was done in the hope of stabilizing the gold mining industry, and stopping the boom and bust cycle which had followed previous gold rushes elsewhere.

However, it opened the door to a entrepreneur named Treadgold to monopolize the Klondike gold fields through procurring water rights and large government concessions. His activities virtually eliminated the small miner.

When Treadgold was granted his concessions Dawson and the Klondike were up in arms and delegates were sent to Ottawa. The outcry resulted in a Commissioner being appointed to, "inquire whether the Treadgold concessions were likely to be beneficial or injurious to the mining interests of the said Yukon Territory". Justices Britton and Bell arrived in Dawson August 13, 1903 and had a very stormy three weeks of hearings which were adjourned abruptly at 12:40pm September 7th, when Justice Britton flew into a rage at Mr. George Black, Counsel for the mining interests. The two Justices then headed for the river and boarded a steamboat heading south. They returned to Ottawa, where Commissioner Bell died in March of 1904 before their report was filed. Britton finally was persuaded to write his report which was tabled in the House of Commons in August 1904. Treadgold, despite recommendations in the report for moderation, kept his concessions. A battle for control of the gold fields, not between small placer miners, but between the big dredging companies then took place. Big companies dominated the Klondike until 1966 when the Yukon Consolidated Gold Corporation dredges worked their last shifts.

All through the years that the dredges were churning away in the Klondike, miners who had come north with the stampede in '98 and decided to stay hand worked and prospected throughout the Yukon. There had been a short Gold Rush in the Kluane Fields in 1903, and Burwash Creek continued to be a lucrative producer. In the Mayo area Minto, Highet and Mayo Lake tributaries provided profitable claims. On the Stewart River - Scroggy, Henderson and Clear Creeks were

worked. Thistle, Kirkman, Coffee and Ballarat Creeks were mined on the Yukon River. Mount Nansen and Freegold in the Carmacks area and Livingstone Creek northeast of Whitehorse also saw activity. For the most part these were one and two man, hand mined operations and the individuals lived and died on their property. It was a way of life and they mined to meet their needs, always looking for the new bonanza.

In 1934 the U.S. set the price of gold at $35.00 an ounce almost double the old price. During the '30's depression a new wave of prospectors flooded north and old workings were mined yet again. Hand methods were still the most common, however, by 1939 "Cat" mining was becoming more prevalent and continues to the present day as the industry standard.

By the end of the 1940's high costs for labour and supplies were forcing many miners to close. Interested in maintaining gold production,the Federal Government introduced a subsidy on gold production to aid mines to stay in business. The Yukon Placer Mining Act was amended to cut royalties to 22½¢ per ounce.

The 1960's were a very low period for the industry, most placer mining operations ceased and only a handful of old timers and hobby miners continued to operate. Profits were low or non existent.

With the freeing of the price of gold in 1972, placer mining began to take off and by 1978 a new gold rush was in full swing. New small operations equipped with modern machinery such as D8's, diesel pumps,and front end loaders moved into the old areas and tailings were once again reworked. Volume

was the name of the game and continuous sluicing was not only possible but necessary to maximize profitability.

During the late '60's and early '70's the environment was becoming a public concern throughout North America and new tougher, legislation was being considered. In 1972 the Northern Inland Waters Act was introduced and it replaced parts of the Yukon Placer Mining Act. It proved inadequate to handle the mid '70's rush and so the use of water authorizations was established to expedite the process to meet the great demands for water use permits - a procedure now being challenged in the courts.

The Yukon Territory Water Board, constituted under the Northern Inland Waters Act, drew up an interim set of guidelines to assist the Controller, but the system was discretionary and with the rush of new staking and mining being undertaken, interpretation of the guidelines varied. A deep hostility towards the federal bureaucrats grew and it was very soon recognized that the three regulatory Acts, the Fisheries Act, Northern Inland Waters Act and the Yukon Placer Mining Act, were not written to be used in concert and many problems arose. The industry was frustrated and was demanding action and some clear cut direction. This was not necessarily a cry for more regulation.. The more moderate persons in the industry recognized that there would be a need for some type of regulation but they wanted a hand in its drafting. The federal government, frustrated by multiple legislation requirements, interpreted the demands as a need for comprehensive regulation, and so in 1978/79 steps were taken to draw up a new set of guidelines which would give direction for new regulation. In 1979 the industry was riding a high - $600 - $800 per ounce of gold. In the same year, the Yukon Territory Water Board tried to establish a new set of guidelines which would meet both government and industry needs but ran into a brick wall - the Fisheries Act. They then turned the problem back to

the Department of Indian Affairs and Northern Development. The federal bureaucrats from the three departments - Indian Affairs & Northern Development, Environment and Fisheries & Oceans - tried to reconcile the differences with the industry, and to involve the Government of Yukon, but the situation was not conducive to compromise. And so the Federal Government went its own way and developed a set of draft guidelines.

In some ways history is repeating itself. In 1903, the Minister of the Interior appointed a committee to hear the concerns of individual placer miners. It was almost 75 years before the small miner was once more "King of the Klondike", (although this was not mentioned in the hearings). In our recommendations we feel the solution will be more positive, with benefits for all - mining, fishing and the environment.

3. THE ISSUES: AN OVERVIEW OF THE HEARINGS

The public hearings revealed that not much had changed since the Water Board hearings in 1979. The vast majority of those who made representation to the Committee were solidly opposed to the proposed guidelines. Conservation interests supported the guidelines while calling for further provisions to protect other resource values. Little had changed and with the transcripts from both the 1979 and 1983 hearings now available it is not recommended that further public hearings be held on the subject.

The placer mining industry's reaction to the guidelines was overwhelmingly negative. Fear seemed to be the underlying emotion, combined with a sense of helpless frustration with a system that they could not influence and that did not seem to understand their problems. The tone of many presentations indicated a very high level of suspicion of the motives of government and civil servants and an alarming degree of animosity between the industry and government. The amount of credibility given the guidelines by much of the industry was summed up in the following statement by a miner in Dawson City:

> "It appears to me that the people that drew up the guidelines,..... have the education of a Philadelphia Lawyer and the common sense of a canary." [1]

Nevertheless, very few of the critics of the guidelines suggested that there should be no controls at all. As the hearings progressed a number of key issues emerged.

The Limits of Flexibility and Compromise Within the Guidelines

It is the position of the ICPM that the profitable extraction of placer gold and the protection of fish, fish habitat, the surrounding terrestrial areas, and other resource values are not mutually exclusive. They argued that the proposed guidelines are flexible and incorporate many compromises which are reflected in less than ideal requirements and standards for the protection of the environment and particularly for fish and fish habitat.

They pointed out that B and C streams have been permitted an effluent standard of 100 mg/l even though they know that water containing that concentration of suspended solids can adversely affect salmonids. Furthermore, they cited the X category, the compliance schedule, and the provision for altering the stream classification as other examples of the compromise and flexibility that have been built into the guidelines. Most significant of all, they noted several times during the hearings that strict enforcement of the Fisheries Act could have closed down the industry. The fact that this has not happened is a very major compromise in itself.

Industry representatives and others who opposed the guidelines, saw little evidence of compromise or flexibility in the guidelines. Those who expressed more considered opinions argued that some of the standards were simply not attainable at an economic cost, while other standards, depending on the location of the operation, were not attainable at any cost. More extreme views saw the guidelines as over zealous regulation designed to close down much of the industry. Still others wondered about the "larger motives" or hidden agenda behind the guidelines. As one intervener mused:

> "..... the argument is persuasive that the federal government or agencies within the government would like nothing better than to see implementation of the proposed guidelines to result in a significant depopulation of Yukon, one that would seriously weaken Yukon's legitimate aspirations for ultimate provincehood." 2

Gold vs Fish

To many the issue came down to simply which is more valuable, the gold resources of Yukon or the fish resources. In some quarters it became known as the "gold-fish debate". Those who saw it this way, were adamant that there was no comparison between the gold resource and the fisheries resource. Gold was the winner, hands down !

To these people, placer gold contributed much more to the economy of Yukon and it just didn't make sense to impose guidelines to protect fish at the risk of damaging the industry.

The federal government and conservation interests countered that there was more to the issue than gold versus fish. They pointed out that there were other resources and values that had to be considered, such as wildlife, vegetation, aesthetics and wilderness. Apart from any comparison of the relative values of these resources, government had the responsibility to be the guardian of all resources.

Legal Issues

Two legal issues related to the proposed guidelines were raised during the hearings. One was the legal status of the proposed guidelines and how these "guidelines" should have the force of law. The other issue was whether or not compliance with the guidelines would also satisfy the provisions of the Fisheries Act, and thus, protect placer miners

from prosecution under this Act.

The Yukon Conservation Society stated that the proposed guidelines amounted to a:

> "usurpation of the powers of the Water Board granted by Parliament through 'guidelines'...." [3]

and that the guidelines would lead placer miners and public officials to ignore provisions of the Fisheries Act and place themselves in legal jeopardy.

The Yukon Government also commented that the guidelines appeared to be an attempt to amend the Northern Inland Waters Act by transferring powers and duties from the Yukon Territory Water Board to DIAND.

These issues were not extensively discussed or questioned during the hearings beyond the presentation made by the Yukon Conservation Society. This was so for two reasons. First, it was not within the Committee's Terms of Reference and second, because the ICPM chose not to deal with the legal issues as they felt it was beyond their competence to address matters of legal opinion. Nevertheless, these issues loomed large in the background throughout the hearings and were of serious concern to many interveners.

Ethical Considerations

Also very much in the background were some ethical questions. These questions were not fully discussed during the hearings but they were raised briefly on several occasions. From the point of view of government and conservation interests there were a number of questions about the need for regulation from a strictly ethical approach,apart from the relative values of the resources - Should not those who disturb the environment

for personal gain be required to restore the environment to its previous state or facilitate that restoration? Is it right that one resource should be written off or seriously compromised in deference to another?

From the point of view of mining interest - Is it right that some operators may have to cease operating or incur much added expense to continue a lifestyle they may have pursued for many years with the active encouragement of government?

The fact that these issues were not openly debated does not diminish their importance.

It was clear throughout the hearings that these issues were very much in the back of peoples minds and the following comments are examples of their concerns:

> "all I can say is that these new guidelines, as far as I'm concerned, even a small part of them,I wouldn't be able to operate because my ground isn't that rich, and there is not that much left over for anything new, other than what I have already had to do";[4]

> "I agree we must do something to protect our environment and our fish, but please be very thorough and be sure you are dishing us up a salmon and not bureaucratic red herring";[5] and

> "So, lets try to make it a little realistic on these guidelines, like I say I'm not for no guidelines, we've got to have them, I can see that, I've mined, I've gone around the different operations, I've seen their operations, I can see where they really were - where the environment really catches hell".[6]

The last day of the public hearings was set aside to hear summary presentations from the ICPM and the registered interveners. The Committee was presented with a number of recommendations, however, little in the way of compromise was evident.

The Klondike Placer Miners Association were firm in their opposition to the implementation of the proposed placer mining guidelines. The Yukon Conservation Society felt that the Committee had not been allowed to examine alternatives to the guidelines and, therefore, further work must be done before recommendations could be made. Other interveners with the exception of the Yukon Association of Wilderness Guides, supported the position of the Klondike Placer Miners Association.

The Interdepartmental Committee on Placer Mining stood behind the proposed guidelines and did not propose any significant amendments to them. They acknowledged the weakness of the socio-economic analysis and expressed some doubt about the attainability of the 100 mg/l effluent standard. They also critiqued some of the other approaches to regulation of the industry that were raised during the public hearings.

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1 Transcripts - Yukon Placer Mining Guidelines Public Review Committee - Volume XIII - September 23, 1983 Dawson City, Yukon - Page 2986 - Mr. Close.

2 Written Intervention to Yukon Placer Mining Guidelines Public Review Committee - August, 1983 - Prepared by the Yukon Transportation Association - Page 4

3 Written Intervention - Legal Opinion on the Draft Placer Mining Guidelines submitted on Behalf of the Yukon Conservation Society to the Yukon Placer Mining Guidelines Public Review Committee - Prepared by Andrew J. Roman - August 19, 1983 - I. Summary of Opinion Page 2.

4 Transcripts - Yukon Placer Mining Guidelines Public Review Committee - Volume II - September 8, 1983 Whitehorse, Yukon Page 496 - Mr. Zeiler.

5 Transcripts - Yukon Placer Mining Guidelines Public Review Committee - Volume III - September 9, 1983 Whitehorse, Yukon Page 735 - Ms. Hanna.

6 Transcripts - Yukon Placer Mining Guidelines Public Review Committee - Volume III - September 9, 1983 Whitehorse, Yukon Page 739 - Mr. Holway.

4. PRESENT AND PROPOSED GUIDELINES

At present the Yukon placer mining industry is regulated by guidelines which were adopted by the Yukon Territory Water Board in 1975. These guidelines are very general in nature, they lack rigorous standards and they give much discretionary authority to public officials, most notably the Controller of Water Rights (DIAND), and the Water Use Inspectors that come under his authority. There is unanimous agreement by the mining industry and by government that these guidelines are not satisfactory and need to be improved.

Industry is not happy with the discretionary authority that rests with the Controller of Water Rights. For its part, government is concerned that these guidelines do not meet legislative requirements nor do they provide adequate protection for the environment. The weakness of the 1975 guidelines was demonstrated when the industry underwent a rapid expansion in response to soaring gold prices in 1979 and 1980. Of special concern to Government, was the expansion of the industry into areas which had never been mined and were, therefore, more environmentally sensitive than the historic mining areas. While certain industry practices may have been acceptable, or at the least tolerable, in the historic areas they were seen to be detrimental to the environment and, therefore, considered unacceptable in these new areas.

In 1979 the Yukon Territory Water Board undertook a major revision of the 1975 guidelines, and conducted a public hearing in the fall of that year to review the revised guidelines - Interim Guidelines for Authorization to Use Water for the Purpose of Placer Mining in the Yukon Territory.

These proposed interim guidelines were generally supported by the Government but clearly opposed by the placer mining industry. After its deliberations on the subject the Water Board concluded that it could not develop nor implement new guidelines until the Minister provided policy direction and a legislative framework.

The 1975 guidelines are still in effect today. It was clear throughout the hearings, neither the government nor the industry was satisfied that the present guidelines give clear direction to miners and public officials. Having recognized the inadequacies of the 1975 guidelines it may seem inconsistent that the Committee now takes the position that in certain circumstances these guidelines should continue. However, the intent of our recommendations must be fully understood. It must be recognized that those who are now working in the industry have made their investment based on a Water Use Authorization, which requires them to meet where practicable, certain conditions.

The Committee accepts that miners are now meeting the 'best practicable' standards, given cost and physical restraints. Indeed the very fact that they have been issued water use authorizations indicates that Government recognizes that they are meeting these standards and in effect has given its approval to industry practice as it exists today.

Draft Yukon Placer Mining Guidelines

As a result of the communications between the Yukon Territory Water Board and the Minister of DIAND preliminary steps to develop the proposed guidelines began. The Minister commissioned a number of environmental studies related to placer mining and a steering committee comprised of government and industry officials was struck to oversee these studies. Consultation between industry representatives - the Klondike

Placer Miners Association-and Government was initiated and a number of meetings were held to review discussion papers and to present their respective positions.

Work on the guidelines began in 1981 under the sponsorship of DIAND in co-operation with the Departments of Environment and Fisheries and Oceans and the industry. Consultation with the industry broke off in the early months of 1982 amid mutual recrimination. By October of that year the guidelines were complete.

Description

At the heart of the proposed Draft Yukon Placer Mining Guidelines are two essential elements: The Development Plan and a Stream Classification System.

Development Plan

The development plan requires all miners whether they are testing their ground or actually mining it, to provide a description of their project. This description will include information on the following:

- property size and location
- machinery and equipment that will be used
- information about the basic geology of the area

If the miner is mining his property then the development plan will provide additional information on the following:

- a detailed layout of the operation
- a description of the deposit and the mining methods that will be used
- water sources and the volume of water that will be used

- water treatment
- rehabilitation of the mined area and the disposal of surplus equipment and buildings

Those operators who are undertaking testing programs would be required to provide a development plan that included a description of their project as noted above and would also be required to provide information on the following:

- the past workings on the property
- the method of exploration
- water requirement, acquisition, and treatment
- the use of chemicals
- anticipated environmental impacts and proposed control measures
- the rehabilitation of the area upon completion of the exploration program

The ICPM placed heavy emphasis on the importance of the development plan. As Mr. Denis Watson, Chairman of the ICPM, noted in his remarks on the first day of the public hearings:

> "We are recommending, strongly, that a development plan be a very fundamental part of the regulatory system for placer mining. We also, suggest that development planning which initially may lead to certain costs which operators are not accustomed to, will in the long run, enhance the operators multi-year operations and hopefully result in greater profits to him."[1]

Stream Classification

The stream classification system places streams or portions of them (reaches), into five classifications (A,B,C,D,X),based on biological sensitivity, fisheries resource values, and past mining activities. This classification recognizes that different levels of protection are required by different species of fish. It also recognizes the life cycle sensitivities of fish by providing the most protection for the most sensitive life cycle phase.

Class A streams, generally referred to as salmon spawning streams, are afforded the highest level of protection. The B,C and D classifications recognize decreased resource values and sensitivity in a stream and consequently provide lower levels of protection. The X category recognizes areas where mining activities have been carried out for many years and where resource values are, consequently, much lower. Class X streams are, therefore, afforded the least protection.

In short the stream classification system is based on a positive correlation between fisheries resource values and the level of protection that is to be afforded these resources.

To provide the level of protection appropriate to each of the categories of streams, the classification system sets out general guidelines for all categories and varying site specific guidelines for each of the different categories of streams.

The general guidelines are just as they are described. They outline measures governing the rehabilitation of the mined area, fuel storage and handling, domestic water use, garbage disposal, the disposal of solid waste material, the provision of fish passage, and regular monitoring of the effluent by the operator.

The site specific provisions set varying standards for each of the stream categories - the higher the fish resource values the more stringent are the standards.

For A and B streams there are standards governing the rate and method of water acquisition, the quality of waste water discharge, leave strips, the operation of equipment and machinery near the stream, and there is a prohibition against stream diversions.

Class C and D streams are covered by standards for the rate and method of water acquisition, quality of waste water discharge, and stream diversions.

The standards for X streams are the same as for D streams except the requirement for fish passage.

The most readily identifiable and probably the most critical difference between the five stream categories is the proposed suspended solids effluent standards. For Class A streams no effluent is permitted to be put into the stream. Class B and C streams are subject to an effluent standard of 100 mg/l above background. Class D and X streams are permitted an effluent of 1,000 mg/l above background if they debouch into a major D and 100 mg/l above background if they debouch into any other class of stream.

It should be noted that "background", is to be measured at headwaters - upstream of all the ground that is disturbed by mining activities.

A major D stream was defined in an errata to Yukon Placer Mining Guidelines as "a river with a high natural background level of suspended sediment used by fish primarily for migration purposes". The same errata also provided two examples of a major D stream - the White River and the Yukon River downstream of its confluence with the White River.

Compliance Schedule

All conditions of the guidelines will become effective during the 1984 season. The effluent standards will be phased in over five years for operations on C, D and X streams. Operations on A streams will have one year to meet their prescribed standards and operations on B streams must meet the effluent standards in the first year the guidelines become effective. New operations on streams not previously mined are required to meet the ultimate effluent standard required for such streams in their first year of operation.

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1 Transcripts - Yukon Placer Mining Guidelines Public Review Committee - Volume I September 7, 1983 Whitehorse, Yukon Page 23 - Mr. Watson

PART III
RECOMMENDATIONS

5. COMMITTEE REVIEW OF THE PROPOSED GUIDELINES

5.1 General Remarks

This section reviews the major components of the proposed Yukon Placer Mining Guidelines and sets out the Committee's findings which then become the rationale for the Committee's recommendations.

This review will examine the four subject areas discussed in the background papers to the proposed guidelines and will also examine some of the specific provisions of the guidelines. These subject areas also drew the most comments and expressions of concern during the hearings and in the presentations made to the Committee.

One of the main criticisms of the draft guidelines was that they were too open ended and left the impression that there was more to come - that these guidelines were really only the beginning. Examples of this can be found on page 7 - The Guidelines Framework:

> "While it is anticipated that in the future, issues such as wildlife, vegetation ... will be formally incorporated in the guidelines....."

> "It should be noted that some aspects of water use are not covered in these guidelines."

It is to be expected that more requirements will be incorporated into the guidelines in the future - legislation is never finite.

As you build your data base and society's needs change so does the regulatory process, however, with the long history of confrontation associated with the development of the placer mining guidelines more care should have gone into spelling out precisely what would be required.

The language of the guidelines was often vague. For instance as part of the requirements for the development plan the miner is required to provide "an outline of the extent of paydirt zone, estimating volumes of paydirt and estimating volumes of overburden to be removed". It is not made clear, however, what is meant by "outline". Is it a best estimate or does one have to conduct an extensive drilling program? There are other similarly vague provisions in the proposed guidelines where what is required could quite reasonably be interpreted as ranging from a best guess to a comprehensive study. As the hearings progressed and questioning brought out more precisely what was required by the guidelines it became clear that what Government was asking for in these guidelines was generally reasonable. The placer mining industry, however, was convinced that the guidelines would be interpreted as strictly as possible and expressed little confidence in assurances to the contrary.

The guidelines were really only a discussion paper, and yet to the industry they were a fait accompli. In the Committee's opinion the government, with all its available expertise, should have been able to convey the intended process during the three years the guidelines were in the making. This did not happen and the hearings, which should have been held to discuss Yukon Placer Mining Guidelines, were in fact a confrontation between government and industry with the Committee being referee. Fault for this situation must, however, be shared with the industry, whose interest in co-operation over the past three years was often less than whole-hearted.

5.2 Stream Classification

The stream classification system outlined in the proposed guidelines has been described in Section 4 of this report.

The evidence that the Committee heard about the stream classification system was based on the background paper A Rationale for the Classification of Rivers, Streams and Lakes in the Yukon Territory in Relationship to the Placer Mining Guidelines. This paper explains how the classification of streams, rivers, and lakes was developed and how the classification system would fit into the matrix of the A,B, C and D streams as outlined in the guidelines. Briefly, the system designates portions of the streams as "reaches" and then classifies them on a habitat quality basis by using the physical characteristics of the terrain in each stream in conjunction with the known presence of and life history of each fish species. Eighteen criteria were used to establish the classification of the reaches.

The Committee received much comment on the stream classification system. Mining and mining related interests based most of their criticism on their contention that the system was based on incomplete data. More specifically, they argued that there is not enough detailed field data on habitat quality and fish abundance to develop a system such as the one proposed and that in the absence of such data the authors of the system have had to rely on "unverified assumptions... about fish habitat presence, species, utilization and life history patterns in many of the remote Yukon streams".[1] These interests also criticized the provisions outlined in the guidelines for challenging the stream classification assigned to a particular operation. The criticism here was that the scope of the requirements outlined in the guidelines was too broad and would, therefore, be expensive. It was also argued that it appeard that the miner would have to provide more detailed information to have his area classification downgraded than government provided to classify it in the first place.

In reply to these criticisms government acknowledged the lack of complete field data but pointed out that a start had to be made on developing a stream classification system and that neither the time nor the resources were available to enable them to gather all the field data. They also pointed out that they have been able to test the accuracy of the classification system by comparing it with the findings of studies conducted under the auspices of the Yukon River

Basin Committee. They found that, generally, it was consistent with the findings of these studies. Furthermore, they pointed out that new information will be added as it becomes available.

In reply to the criticism about the scope of the baseline data that a miner would have to gather in order to challenge his stream classification, the ICPM explained that the provisions outlined in the guidelines represented the most that an operator might have to do. By listing factors affecting their assessments in some detail, the Fisheries biologists felt that miners would have a better idea of what to look for (and what to provide DFO), when requesting reclassification. It was expected that in the majority of cases the scope of the information that the miner would have to provide would be much less than the comprehensive list of factors outlined in the guidelines. They noted that several operators had already requested and received a reclassification of their operation and that this had been done at little or no cost to the operator.

Conservation interests criticized the classification system because it, by and large, only deals with the fisheries resource. They felt that other resources such as aesthetics, wildlife, and wilderness values should have been incorporated into the system.

The Committee concluded that, in principle, the stream classification system is sound. By saying this the Committee does not mean to infer that no criticisms levelled against it had validity, but rather to say that the system stood up well under these criticisms and that they were by no means fatal to the system.

The Committee has no doubt that as new information becomes available it will be incorporated into the system and that appropriate revisions will be made. The Committee assumes this will be done by government officials as a matter of course as they indicated in their presentations to the Committee.

Other resource values that are not now included in the classification system can be worked in later without any insurmountable difficulties.

As for the question of altering classifications of streams downwards, the Committee accepts that the procedures will, in most cases, be dealt with quickly and at minimal cost to the operator as explained to the Committee by the ICPM.

5.3 Effluent Standards

The effluent standards prescribed by the proposed guidelines have been described in Section 4.

The evidence on this subject was based on the background paper A Rationale for the Suspended Solids Standards for Yukon Streams Subject to Placer Mining. This paper presents a detailed review of the impacts of sediment on primary producers, stream invertebrates, and on fish. It proposes a maximum sediment discharge standard for each stream classification. These standards were designed to recognize the sensitivity based classification of the stream classification system, the fact that sediment is a broad spectrum pollutant, and past mining activities.

The ICPM's presentation on effluent standards and the rationale behind them left some members of the public incredulous. Many of those who appeared before the Committee simply could not accept that sediment was a pollutant, nor could they accept the ICPM's contention that not only was it a pollutant but a major one at that. Their beliefs were generally based on the observation that the deposition of sediment into Yukon water systems is a naturally occurring phenomenon, therefore, how could the same sediment deposited into the same waters by placer miners be regarded as a form of pollution? They also noted that placer mining does not involve the use of toxic chemicals and thus could not be accused of introducing unnatural substances into the environment.

Despite this scepticism no one presented any scientific analysis or opinion to refute the evidence presented by the ICPM. More considered opinions tended to concede that the government had proved its case. The KPMA in their submission to the Committee admitted that:

> "Solely on the basis of the information presented it would not be possible to refute the rationale presented by DFO. The technical data presented in support of the need for sediment regulation is solid information taken from the body of ecological literature." [2]

The Committee found the ICPM's presentation on the subject of suspended solids and effluent standards to be convincing and is of the opinion that the proposed effluent standards are appropriate for the

protection of fish and fish habitat. The Committee, therefore, accepts in principle the ICPM's presentation on the effect of sediments on fish and fish habitat and the rationale for the proposed effluent standards.

5.4 Attainment and Cost of Placer Mining Effluent Guidelines

In the background paper to the proposed Yukon placer mining guidelines The Attainment and Cost of Placer Mining Effluent Guidelines, the Government proposes ways in which placer miners may be able to meet the effluent standards of the proposed guidelines.

Using assumptions about the size of the operation, the settling ability of the silts and clays in the wash water and the percentages of each, and the efficiency of water use in sluicing, the paper develops a model for a typical operation and the methods used to treat its effluent. Using this model, the paper outlines three schemes for settling systems to attain the required standards (0, 100, and 1,000 mg/l), and provides estimated costs of construction, purchasing, and operation for each scheme. All three schemes require the use of settling ponds.

The subject of the attainment and cost of placer mining effluent guidelines sparked some of the most intense debate during the hearings. Mining interests believed that the effluent standards could not be consistently met by most operations at an economic cost or, in some cases, at any cost. Three concerns emerged.

First, there was concern over whether or not it was physically possible to build adequate settling facilities given the site specific constraints of any particular operation. Of most concern was narrow valleys where there might not be enough physical space to build the facility. Information provided by the ICPM indicated that a major portion of current operations are located in narrow valleys - perhaps somewhere between 50 and 75%.

Second, there was concern over safety. In narrow valleys with relatively steep grades the impoundment of large volumes of water presents serious potential hazards to other operations further downstream. This concern would be even more pronounced in areas that are subject to flash floods and heavy runoffs.

Third, there was the concern over whether settling facilities can settle out fine clays. These materials are very difficult to settle out and there is the risk that despite the committment of a considerable amount of expense and effort, the facility will simply not be able to achieve the required standards.

Industry representatives were also very critical of the cost estimates in the paper, and provided their own estimates which were strikingly different from those presented by the ICPM. In the KPMA's submission their estimates of the cost of constructing each of the three schemes were greater by a factor that varied from 2 to 8 depending on the scheme in question. The Committee listened to much debate on this, however, it could not resolve which estimates were the more credible.

The question of the cost and the attainability of the effluent standards raises some very serious doubts in the minds of Committee Members. The Comittee is satisfied that the concerns of the mining community in this area are well founded. No substantive evidence was heard which could cause the Committee to believe otherwise.

The Committee's doubts in this area are centered on four points.

First, if it is not feasible to meet the proposed effluent standards by the methods proposed (settling ponds), then this suggests that other methods of meeting the standards, or other standards, should be employed. There was however, no evidence presented to the Committee to convince us that there were any methods other than settling ponds by which to meet the effluent standards. The use of flocculants was discussed and suggested as a method that could be used to improve settling efficiency in the ponds. Although the Committee was impressed with its potential, its practical application to placer mining remains unproven. The Committee, then is led to believe that other standards for placer mining effluent should be considered.

Second, if it is not feasible to meet the proposed effluent standards with existing technology then there is some existing investment in the industry which may be abandoned. These investments were made under a less stringent regulatory regime and under the limitations of then existing technology to meet the requirements of that regime. The regulatory regime proposed is many times more stringent yet the technology with which to meet the requirements of that regime has not improved

to the same extent.

Third, the question of the attainability and cost of meeting the effluent standards raises in the Committee's mind the broader question of what is the purpose of these standards and is the cost of achieving that purpose worth it. This leads into the socio-economic analysis that was presented and criticized during the hearings and which will be discussed in the next section. However, a few comments will be made here. The Committee notes that the standards are designed to protect fish and fish habitat and has accepted, in principle, that the levels set are sound and reasonable from the point of view of affording this protection. The Committee has no difficulty supporting the level of protection that the proposed guidelines provide for salmon and salmon habitat. This notwithstanding, the Committee has some very serious reservations about the level of protection afforded other less sensitive and less economically and socially important species, most notably grayling. If it were a case of protecting these other species from extinction or severe population degradation then on strictly ethical grounds the Committee could support the standards proposed for their protection. However, the evidence we heard has led us to conclude that their populations are at healthy levels, they are a relatively hardy species, and that they can recolonize relatively easily. Therefore,the Committee is sympathetic to much of the public concern over requiring the industry to incur this additional cost in order to provide more protection for these less significant species.

Fourth, the Committee is concerned about some of the equity considerations that are involved. Investment made under the present regime may no longer be economic under the new proposed regime. Implementing the proposed guidelines will involve casualties. The extent of these losses cannot be estimated, however, the Committee believes that overall these losses will not be compensated by gains in other areas. Should the operators absorb all of the costs associated with the change in the regulatory regime? Should there be compensation for the casualties?

These concerns have convinced the Committee that the existing industry should receive special treatment under any new regulatory regime. Existing investment must be protected.

5.5 Socio-economic Considerations

The Committee heard presentations on four socio-economic analyses on the Yukon Placer Mining Guidelines.

- Socioeconomic Impact Analysis for Yukon Placer Mining Guidelines (prepared by the Department of the Environment for the ICPM);

- Benefit-Cost Analysis of the Proposed "Yukon Placer Mining Guidelines" (prepared for the Department of Fisheries and Oceans and the ICPM by Marvin Shaffer and Associates Ltd);

- Discussion of Benefit Cost Analysis of Yukon Placer Mining Guidelines (prepared for the Yukon Conservation Society by R.K. House and Associates Ltd); and

- An Assessment of the Proposed Yukon Placer Mining Guidelines (prepared for the Klondike Placer Miners Association by IEC Beak Consultants Ltd).

A summary review of the analyses was prepared for the Committee by DPA Consulting Ltd. and appears as Appendix E of this report.

These analyses provided remarkably different conclusions. Estimates of the number of operators that would cease to mine because they could not comply with the guidelines varied from 16% (ICPM) to 85% (KPMA).

Benefit-cost ratios varied significantly ranging from .03 to 1.55 (assuming a discount rate of 10% and including results from sensitivity tests).

All of the analyses share two common deficiencies.

First, they are all based on a very limited data base. Currently there is not a sufficient body of unbiased financial data on the placer mining industry with which to conduct a thorough analysis of the cost implications of the proposed guidelines.

Second, because of the limited data all of the analyses have had to rely on the generous use of "averages". It is well known that there are many factors that vary from operation to operation and from area to area so that it is virtually meaningless to talk about an "average" for the industry.

The Committee was not able to assess the relative credibility of these analyses and, therefore, is not prepared to draw precise conclusions from them, however, it can make one categorical conclusion - the economic analyses presented should not be looked upon as being decisive in making what is unavoidably a political decision.

The Committee would, nevertheless, like to put forward the following general observations.

First, as best as can be determined, the overall costs associated with the introduction of the guidelines would exceed the benefits. This will certainly be the case in the short term. In the longer term the variability of the factors involved, the lack of a credible data base, and the difficulty in quantifying some of the major variables are such that it would be speculative, at best, to try and estimate the impact of the guidelines.

Second, from the perspective of Canada, there is a disproportionate distribution of the costs and benefits associated with the guidelines, with Canada bearing virtually all the costs, while much of the benefits would go elsewhere. Efforts by miners to protect fish and fish habitat will enhance existing stocks which will be harvested under existing agreements, largely by foreigners - most notably Alaskans- with out compensation to Canadians.

Third, from the perspective of Yukon the disproportionate distribution of the costs and benefits associated with the guidelines is even more acute, the Yukon will bear most of the costs and enjoy even less of the benefits.

It is acknowledged that Canada is probably the appropriate "referent group", in this kind of analysis, however, since the guidelines will affect this one industry and in only this one region of Canada, the Committee believes that the Yukon impact deserves the most careful consideration.

Fourth, notwithstanding the dramatic variations in the socio-economic analyses that were presented to the Committee, it was clear in all the analyses that a favourable negotiation of the Canada/U.S. Pacific Salmon Treaty, and in particular some agreement on the Yukon River, is critical to any benefit/cost analysis. It is apparent from these analyses that the inclusion of the benefits that would be expected to result from a favourable negotiation of the sharing of Yukon River salmon stocks makes a significant improvement in the benefit-cost ratios. Without these benefits the Committee sees little reason to insist on standards and provisions as stringent as those found in the proposed guidelines. If the beneficiaries of the efforts and expenditures by Canadian miners and taxpayers to protect fish and fish habitat are not willing to agree to a more equitable distribution of the costs and benefits than at present, then the Committee sees little economic justification for many of the standards and provisions of the proposed guidelines.

It must be recognized that the Yukon River is one of the continent's most productive salmon systems and it must be remembered that about half of the production of juvenile salmon come from the Canadian section of the river. The economic benefits of this production to Canada and the Yukon is at present slight. An

equitable division of benefits is long overdue.

Fifth, regardless of socio-economic considerations there should be provision in any regulatory regime to protect and maintain fish population levels for all species and strains of species that are sufficient to guarantee their survival. The Committee believes that Canadians have a moral obligation to prevent the loss of any specific strain of any species. Socio-economic considerations are, therefore, relevant to enhancement of fish stocks above this basic minimum level. Below it, biological considerations should prevail.

Sixth, there was no evidence presented which would lead the Committee to conclude that any species, or strain of species, were in imminent danger of extinction or near extinction. This leads the Committee to observe that virtually all of the provisions of the guidelines would enhance present stocks rather than protect them from some known or perceived danger. Concern was expressed over the Klondike River salmon; however, this was not discussed in detail and thus the Committee can do little more than acknowledge this concern.

Seventh, following the observation that the provisions of the guidelines are for enhancement of present stocks rather than for their protection, it would appear that the economic justification for the guidelines in their present form is somewhat weak. The justification for the enhancement of salmon stocks can be supported with much greater confidence than other species; however, as noted above this economic justification would depend on the conclusion of an agreement with the U.S. concerning the sharing of Yukon River salmon.

The Committee can find little justification for enhancement of other species in areas now subject to placer mining. The evidence that the Committee heard suggested quite strongly that the social and economic importance of these species in areas now being placer mined is marginal.

Eighth, at present the Yukon economy is weak. The placer mining industry is one of the few healthy industries in Yukon. Before any new regulatory regime for the industry is introduced full consideration must be given to these two points. If the provisions of the guidelines were for the protection of fish resources that were in critical danger, then these points might have less relevance, however, if it is accepted that these measures are for enhancement of resources, then government can and should move more cautiously towards the introduction of any new regulatory regime which might adversely impact placer mining.

Ninth, the evidence that the Committee heard suggested that the Yukon fishery and other resource values that are negatively impacted by placer mining, or are likely to be so impacted, make, by comparison with placer mining, a small contribution to the Yukon economy at this point in time.

The current commercial fishing industry cannot yet be judged as viable although the Committee believes that it may be stronger than its critics would suggest. Nevertheless, the commercial fishery is not yet proven. An agreement with the U.S. concerning the Yukon River salmon that would allow an increased escapement of Yukon River salmon into the Canadian section of the

river for harvesting as well as spawning could well see the commercial fishery become an important industry, but at this stage that is in the realm of speculation.

The sport fishery was noted as being the most economically significant component of Yukon fisheries, representing 80% of gross fisheries values. It is the Committee's observation, however, that sport fishing is usually not carried out in areas or near areas that are subject to placer mining and vice versa. This leads us to further observe that the provisions of the guidelines will probably have little impact on the total economic value of the Yukon fishery.

5.6 The Guidelines

i) Development Plan

The provisions of the Development Plan have been described in Section 4 of this report.

In its presentation to the Committee the ICPM described the requirement of a development plan as one of the most important aspects of the proposed guidelines, and recommended that it should be a fundamental part of the regulatory system for placer mining. It was also noted that an effective development plan was not just an aid to government in their role as resource managers but it was also a form of good business practice.

The Committee heard that development planning is done well by some operators, however, it is generally not carried out well, if at all, by the industry at large.

Mining interests were concerned about the scope of the information and the level of detail that might have to be provided in a development plan. They felt that it was not clear exactly what would be expected of them and they found the language of the provision vague and somewhat open-ended. There was also concern that a miner would be bound to the letter of his development plan. They questioned what would happen if conditions and circumstances changed radically part way through the season or at some stage of the operational phase. Would the terms of approval of their plan be flexible enough to deal with such an eventuality?

No doubt the source of much of their concern was the costs that might have to be incurred to produce an acceptable plan. The language of the guidelines, rightly or wrongly, suggested to some miners that they would have to engage the services of geological, engineering and environmental consultants to prepare their plan. Given the scope of the information that seemed to be required it was felt that the cost of these services would be prohibitive.

Despite these concerns the mining community generally supported the concept of a development plan.

The Committee believes that the requirement of a development plan is sound and reasonable, however, we share some of the reservations of the mining community. As written the development plan appears to leave much to the interpretation of both miners and public officials, with consequent opportunity for misunderstandings and conflict.

ii) Rehabilitation

The provisions of the proposed guidelines that deal with rehabilitation require that it be continual and progressive with the operational phase; that a bond or security deposit be posted by the operator; that recontouring of tailings and other materials be undertaken; that topsoil and other soil materials be salvaged and stored for future use in rehabilitation; and that streams be maintained in a stable condition.

The Committee heard little comment on the rehabilitation provisions despite the fact that they were identified as the most significant factor contributing to the cost of compliance with the guidelines. Generally, what comment the Committee did receive expressed qualified support for the rehabilitation provisions. There was some concern that the requirement of progressive rehabilitation ignores the common occurrence that properties are mined and remined several times before being abandoned. It was pointed out that the rehabilitation of the property before abandonment could result in needless expense since there was a good chance that the area would be mined again.

There was also some concern that miners would be expected to rehabilitate the past workings of other miners and that they would be required to undertake an extensive program of seeding and vegetation. These concerns appeared to have been based on a broad, though not unreasonable, interpretation of the proposed guidelines. The ICPM assured the Committee that these requirements were not meant to be part of the guidelines.

The requirement of a bond or security deposit from the operators to ensure that rehabilitation is carried out presents some practical problems. The Committee was persuaded that few, if any, operators would qualify for a bond and that many could not afford to post a security deposit of any substantial value.

It was generally acknowledged that some form of financial security was required and that the amount established should be based on the amount of ground disturbed, the miner's history of compliance, and his proposed schedule of rehabilitation.

The Committee found that there is general acceptance of the need for rehabilitation of mined areas and of the general principles of the provisions of the proposed guidelines. The most difficult question is when should rehabilitation take place? The possibility of areas being mined again - particularly in the historic mining areas - makes progressive rehabilitation of questionable value. On the other hand, the suggestion that rehabilitation be left until the end

of mining has its own particular problems. It would be difficult to define "the end of mining". Leaving rehabilitation to the end of mining increases the risk that it may never be done and limits the options that Government would have to ensure that it will be done.

The Committee believes that if progressive rehabilitation is required then the threat of an order to cease work obviates the need for some form of financial security. If rehabilitation is to be left until the end of mining then some form of financial security would be necessary to ensure compliance.

The Committee is not convinced that all areas should be rehabilitated. There may be some areas that would have historical importance if left in a disturbed state. Some areas may be so naturally unstable or so degraded by past mining activity that it would be pointless to commit much effort or expense to rehabilitating them.

In new mining areas and areas of high biological importance (proven salmon streams) no consideration should override provisions for rehabilitation.

iii) Diversions

Diversions are constructed by miners to divert water away from existing stream beds so that these beds and the area around them may be mined.

The proposed guidelines would allow diversions on C, D and X streams and prohibit them on A and B streams. Diversions built on C streams are to be designed by "professional consultants"; to be able to guarantee fish passage if they are located downstream from A, B, or C habitat; to leave at least one stream bank vegetated; to be stable; to be opened during the spring freshet; to be rediverted, stabilized and rehabilitated on a progressive basis; and to be designed to contain the one in ten year flood event.

For D streams, diversions must be designed to contain the one in five year flood event and provide fish passage if located downstream from A, B or C habitat. Diversions on X streams must be designed to contain the one in five year flood event.

The Committee received relatively little comment on diversions during the public hearings, however, this should not be interpreted as being indicative of a lack of public concern.

It was made quite clear to the Committee that it would be prohibitively expensive for many miners to engage the services of consultants and engineers as they believed they would have to do in order to comply with the guidelines. No doubt these concerns were meant to include the cost of having diversions designed to the engineering standards outlined above.

In principle, the Committee supports the rationale for the standards that would be imposed on their design and construction, however, as before the Committee has some reservations about whether or not it is worth it to incur the costs of meeting such standards.

The prohibition of diversions on A and B streams is not unreasonable where the salmon resource has been proven, although the Committee believes there may be cases where exceptions could be made. The Committee is not prepared to give its unqualified support to total prohibition of diversions on A and B streams.

On the other streams, the Committee believes that the stringency of the standards for diversions is not consistent with the lower social and economic importance and the lower biological sensitivity of the other species of fish that are intended to be protected by these standards.

iv) Leave Strips

The proposed guidelines require that a thirty metre wide vegetated strip shall be left intact on both sides of A streams. A berm, to be constructed between the leave strip and the worked ground, may also be required. The same requirements apply on B streams, however, the width of the leave strip would be reduced to fifteen metres. On C streams it is required

that one stream bank be left vegetated. Leave strips are not required on D and X streams.

Leave strips were discussed briefly at various times during the hearings and a number of interveners made mention of them in their written presentations. The concern over leave strips was essentially that they would limit the miner's ability to exploit all of the gold reserves on his property, particularly on those properties that are located on meandering streams.

The evidence that the Committee heard on the need for leave strips was not convincing. Two reasons were given for requiring leave strips.

First, they maintain a dense canopy of vegetation along the stream which helps to prevent erosion, to provide shelter for salmonids and habitat for their food sources, and to maintain temperature control and dissolved oxygen levels in the water.

Second, they provide a form of isolation of the stream from direct physical disturbance by such occurrences as the sloughing of materials and in-stream operation of machinery and equipment.

The Committee, nevertheless, has reservations about the need for leave strips and some concerns that leave strips may be erroded by the spring freshet on some sites and thus result in more erosion instead of less.

1 Written Intervention - Klondike Placer Miners Association An Assessment of the Proposed Yukon Placer Mining Guidelines - prepared by IEC Beak Consultants Ltd. August 1983 for the Yukon Placer Mining Guidelines Public Review Committee - Section 5 - Critique of the Rationale for Classification of Rivers, Streams and Lakes - Page 5-1

2 Written Intervention - Klondike Placer Miners Association An Assessment of the Proposed Yukon Placer Mining Guidelines - prepared by IEC Beak Consultants Ltd. August 1983 for the Yukon Placer Mining Guidelines Public Review Committee - Section 6 - Critique of the Rationale for Suspended Solids Standards - Page 6-2

6. RECOMMENDATIONS

Introduction

The Committee's recommendations on the proposed guidelines are aimed at achieving three objectives. First, providing miners and public officials with legal certainty. Second, protecting existing investment. Third, the placer mining industry must be brought under a regulatory regime that is consistent with the nature and scope of environmental regulations that are applicable to other industries.

6.1 Legal and Policy Issues

A. Regulations

Regardless of what regulatory regime is adopted the first priority of this new regime should be the provision of legal certainty so that miners and public officials may know what is required of them and govern themselves accordingly. Under the present guidelines such legal certainty is not provided.

The present body of legislation affecting placer mining has been recognized in many quarters as being deficient. The major pieces of legislation governing the industry were developed quite separately from each other and thus they make it difficult to produce an integrated approach to the regulation of the industry.

The Yukon Placer Mining Act was intended to provide for the orderly registration of placer mining claims and to provide a clear delineation of

an individual's rights to the use of land and water. The Fisheries Act was intended to provide protection for fisheries and to ensure a continued resource for that industry without recognizing other water users. The Northern Inland Waters Act is limited to the allocation of available quantities of water to resource users. The Territorial Lands Act is not applicable to mining claims in Yukon.

A review of this and any other pertinent legislation should be conducted in concert with the recently announced land planning agreement between the Federal Government and the Government of Yukon so that policy and legislation for all forms of land and water uses may be properly integrated. It is the Committee's belief that this review and integration of policy and legislation will make a significant improvement to the legal and administrative uncertainty that surrounds the regulation of the industry today. Poor legislation is at the root of many of the problems that plague both miners and public officials.

The Committee, therefore, recommends:

i) That as an interim measure, exemption should immediately be provided through regulations of the Fisheries Act and/or the Northern Inland Waters Act to allow placer miners to carry out established industry practices - most particularly, the returning of sluice

waters (deleterious substances/waste) at specified effluent standards to the water bodies from which they were obtained.

ii) That in the longer term a thorough review of all legislation governing placer mining should be undertaken with the objective of making their application to the industry consistent, each with the other.

B. Policy Initiatives

The success of any regulatory regime is, among other things, critically dependent on the credibility of those who are charged with the responsibility of ensuring compliance with its provisions. The Committee has noted that Government does not, by and large, enjoy the confidence of the public in so far as its regulation of the placer mining industry is concerned.

The Committee, therefore, recommends: that government should take steps to improve its credibility with the public in this area. Four initiatives that might be undertaken are:

i) clear policy statements supporting the placer mining industry, acknowledging its importance to the Yukon, and committing government to working to promote its continued and stable growth.

ii) in co-operation with industry, Government should undertake a program of research and development into better methods of extracting placer gold and treating placer mining effluent. Better gold recovery and improved effluent standards are not mutually exclusive goals, in fact, just the opposite is the case.

The Committee noted during the hearings that there may be new opportunities to foster improved co-operation between the industry and Government and so encourages Government to take advantage of these opportunities.

iii) the Department of Fisheries and Oceans reconsider the direction of its efforts in Yukon and place more emphasis on enhancement programs. The Committee believes that the Department's efforts at enhancement could do more to protect and enhance fish stocks and habitat than emphasis on protection could do alone. We do not suggest large capital expenditures such as hatcheries, but rather labour intensive stream improvement programs.

iv) that a process be provided to ensure the placer mining industry and environmental interests have an ongoing role in developing and implementing policy and regulation. It will only be through such co-operative involvement that the suspicion and hostility of the past will be overcome.

C. Yukon Territory Water Board to Act as the One Window

Many presentations to the Committee recommended that the Yukon Territory Water Board be given responsibility for the issuance of water use authorizations. The Committee found these recommendations to be generally well considered.

To effect this shifting of reponsibilities it is recognized that a number of significant changes will have to be made to the Water Board's procedures. However, the problems that might be associated with these changes are not insurmountable.

The Committee cautions that transferring the regulation of water use by the placer mining industry from DIAND to the Yukon Territory Water Board, per se will not solve all of the inherent substantive difficulties. Regardless of who has the responsibility to issue authorizations and licences, the law, most notably the Fisheries Act and the regulations pursuant to it, cannot be ignored. Rearranging administrative duties will not solve the problems that we now face over the regulation of placer mining. Replacing the few public officials on the Water Board with members of the public, as was strongly suggested by many who appeared before the Committee, will not solve the problems either. Just the opposite would be the case. Having three public officials on an appointed board of nine persons gives needed balance to the Water Board's deliberations,and guarantees co-ordination with other important government policies and legislation.

The Federal Government has a responsibility for maintaining that balance and co-ordination.

The Committee, therefore, recommends:

i) That the Yukon Territory Water Board be charged with the sole responsibility of issuing water use authorizations and/or licences for all placer mining operations.

ii) That the necessary changes to the regulations of the Fisheries Act and/or the Northern Inland Waters Act as recommended in Section 6.1 - C be implemented to permit the Yukon Territory Water Board to take on these responsibilities.

The Committee makes these recommendations for the following reasons. First, the Yukon Territory Water Board already has the statutory authority to licence the use of water.

Second, if all licencing (including the issuance of water use authorizations), is exercised by the Board then an appeal process is in place as set up in the Northern Inland Waters Act.

Third, the Committee observed that the Board enjoyed the confidence of the public and could, therefore, be in the position to more effectively regulate the industry.

6.2 Exemption Under Grandfather Clauses For Existing Operators

The Committee believes that existing operators should be exempt from the proposed Yukon placer

mining guidelines and that any legislation that would give effect to these guidelines should exempt existing operators under appropriate grandfather clauses.

Existing operators would then be subject to the "best practicable" tests of the 1975 guidelines developed by the Yukon Territory Water Board.

This general exemption would be subject to a number of conditions.

First, the exemption under the appropriate grandfather clauses would last for twelve years. Thereafter, all operators would be governed by a regulatory regime similar to the proposed guidelines as amended - the same regime that we propose in the next subsection of this report to apply to new entrants to the industry. Thus, at the end of twelve years there will be a single regulatory regime for all members of the industry.

Second, the Committee recognizes the biological sensitivity of salmonids and their habitat, and their present and potential social and economic importance. Existing operators on streams that are designated A and B under the proposed guidelines would be included under the general grandfather clause exemption and would have to conform to the "best practicable" tests of the 1975 guidelines or meet the standards that are required of them under their most recent water use licence or authorization to use water. However, if the Department of Fisheries and Oceans wants a greater level of protection in these areas then they should be required to prove the presence

of the salmon resource. If DFO can demonstrate the existance of salmon then, the proposed guidelines as amended would apply. Existing operators in these areas should then be financially assisted to help them meet the standards or financially compensated if they cannot meet the standards. Such miners would, of course, be required to prove economic reserves of the gold resource to qualify for such assistance. Judging by the figures presented to the Committee this would involve an insignificant portion of the industry. Data for 1982 presented to the Committee by the ICPM indicated that fourteen operators (3.9% of all authorizations issued), are located on A and B streams and that nine of these operations are categorized as "testing". It would appear then that it would not require a major effort for DFO to prove the salmon resource in these areas - in fact they probably have enough data to prove it today - nor is there likely to be a large expenditure required to financially compensate or assist affected miners.

Third, no operator would be allowed to do less than what is required by the 1975 guidelines or by the terms of his most recent water use licence or authorization.

Exemption under grandfather clauses for existing operators provides a practical and equitable way of dealing with the concerns expressed by miners and by Government.

Existing investment will be protected either outright in the vast majority of cases or by financial compensation or assistance for the

very small minority that will be adversely affected.

The level of protection provided to the environment will be better than what it is today. Proven salmon resources will be afforded much the same level of protection as required in the proposed guidelines. Existing operators will have twelve years to exploit their properties before being subjected to any change in the regulatory system. Furthermore, the "best practicable" test is a moving standard. What is not practicable today may be so in five years, given improved mining methods and the application of new and better technology. Thus, further improvements in the general level of environmental protection can be expected from the existing industry.

At the end of twelve years a single system of environmental protection will be in place, no existing investment will have been adversely affected, no resource values will have been lost or irreparably damaged.

Furthermore, the Committee would like to point out that if Government is correct in its view that the provisions and standards of the proposed guidelines are attainable at reasonable cost, then the regulatory regime for existing operators that we have recommended will automatically converge with the regime that we will propose for new operators. As new operators enter the industry they will prove what is currently practicable. This illustrates the

moving nature of the "best practicable" test standard. It should be noted that this movement will always be towards a higher standard not a lower one. Conversely, if Government's view that the standards and provisions are attainable at reasonable cost is wrong then no harm will have been done to the existing industry which is an objective that the ICPM emphasized many times during the Committee's public hearings.

The Committee, therefore, recommends:

i) That existing operators be exempted under appropriate grandfather clauses from any regulatory regime that would give effect to the proposed guidelines;

ii) That the exemption under such grandfather clauses be enjoyed for twelve years; be applicable to the property itself; and be transferable;

iii) That the proposed guidelines, as amended herein, be applicable to existing operators, irrespective of exemption under grandfather clauses, where the operator is located on an A or B stream and where the presence of the salmon resource is proven;

iv) That those existing operators on A and B streams that must comply with the proposed guidelines as amended be financially assisted to help them meet the standards or financially compensated if they cannot reasonably and economically meet the standards.

v) That no operator that is afforded exemption under grandfather clauses be allowed to do less than what is required by the 1975 guidelines or the terms of his most recent water use licence or authorization to use water.

The Committee recognizes that there may be some operators who are not meeting the effluent standards or other provisions of their most recent water use authorization. There are several reasons why compliance has not been achieved - physical limitations of the property; the costs of compliance may be prohibitive; in some cases the operator may not have extended his best efforts.

The Committee must accept that all operators are doing the "best practicable", at this time.

If Government is not satisfied that "best practicable" is being achieved by some existing operators then this matter should be taken to the Yukon Territory Water Board for adjudication.

Defining an Existing Operator

The Committee acknowledges that there will be administrative problems associated with the exemption it has recommended for existing operators. Defining who is an existing operator will not be the least of these problems. The Committee proposes the following definition of an existing operator:

> An existing operator is a person who mined in 1982 or 1983.
>
> A person is deemed to have mined if he held a valid water use licence or authorization for the purpose of mining; or
>
> If he made bona fide expenditures on a claim (s) or lease (s) with the future expectation of mining. Such expenditures being substantially in excess of the value of the representation work that is required to keep claims in good standing.

6.3 New Operators

The Committee recommends that new operators should be subject to a regulatory regime that incorporates the standards and provisions of the proposed guidelines as amended in this report.

New operators who claim to be unable to meet the standards will not be allowed to mine but it should be remembered that we are dealing with a fixed stock, non-renewable resource. The gold they intended to mine is not lost. It remains for the future day when improved methods and better technology and/or favourable gold prices make it possible to comply with the standards.

The Committee recommends only one exception to this requirement. In areas designated as X streams under the proposed stream classification system, a new operator will enjoy the same exemptions as recommended for existing operators if he is part of a communal effluent treatment plan. Since it is not expected that there are many opportunities for such plans the impact of this exception will be relatively insignificant. Any new regulatory system should, however, be flexible enough to permit communal settling facilities as an alternative to the individual system, provided such a communal system is organized and run by the operators themselves.

6.4 Specific Recommendations on the Guidelines

A. Stream Classification

The Committee makes the following recommendations on the Stream Classification System:

i) Revisions to the stream classification system should be made so that the emphasis of the system is on proven resource values rather than on potential resource values.

ii) All information used to assign a classification to any water body should be readily available to the public.

iii) It should be the responsibility of the Department of Fisheries and Oceans to gather the baseline data necessary for assigning or altering the classification of any area or stream that is now being mined. In areas and on streams that have not been mined the responsibility for gathering such data should rest with the developer.

B. Effluent Standards

The Committee makes the following recommendations on the Effluent Standards:

i) That the effluent standards on A and B streams should be no discharge and 100 mg/l above background respectively.

ii) That on all other streams the standard should be 1,000 mg/l above background.

iii) That on those streams that flow directly into A or B streams there should be a water quality objective of 100 mg/l above background at the point of entry.

iv) That communal settling ponds should be - permitted in areas where their use would be feasible.

The Committee recognizes that its recommendations do not fully address the problem of downstream effects. This is a very difficult problem to deal with and no doubt it also caused considerable difficulties for the ICPM when they drafted the guidelines. However, the Committee believes that with its recommendations the problem of downstream effects will certainly be no worse than it is today. Furthermore, as we pointed out in section 6.2 the general level of protection provided to the environment will improve and no doubt this improvement will include a reduction of downstream effects.

C. Development Plan

In section 5.6 i) the Committee expressed its support in principle for the provisions of the Development Plan as outlined in the proposed guidelines. The Committee also noted some

reservations it had with some aspects of these provisions. The Committee, therefore, makes the following recommendations on the Development Plan:

i) That a development plan should be required for every water use application for the purpose of placer mining.

ii) That Government in consultation with the industry should develop model development plans which can be used by industry members as a guide to estimate the cost of and prepare their plans. It is recognized that Government has undertaken some work in this area and the Committee commends these efforts.

iii) That the scope of the information required in the development plan should be directly related to the biological sensitivity and the past mining history of the area in which the placer workings is to be located, and to the size of the operation as determined by volume of water used and volumes of material disturbed. The more sensitive the area and the larger the proposed workings, the greater should be the scope of the development plan. The more extensive the past mining history of the placer workings and/or its surrounding area, the lesser should be the scope of the development plan.

D. Rehabilitation

The Committee makes the following recommendations on Rehabilitation:

i) Where practicable, rehabilitation should be progressive with the operational phase of the placer workings.

ii) Where progressive rehabilitation is not practicable interim measures which will facilitate future rehabilitation should be undertaken.

iii) Some form of financial security should be required to ensure that rehabilitation is carried out. The amount of the financial security should be related to the amount of ground that is to be disturbed, the past performance of the operator, and the proposed schedule of rehabilitation.

iv) The scope of the rehabilitation work to be carried out by the operator should be related to the historic importance of the area, its biological sensitivity, the natural stability of the area, whether it is likely to be mined again, and the extent of previous mining activity on the property.

E. Diversions

The Committee makes the following recommendations on Diversions:

i) Diversions should be permitted at times of no or limited fish presence during the season on A and B streams where it is feasible to undertake appropriate mitigative measures to protect salmon and salmon habitat.

ii) In such cases where diversions are to be constructed on A and B streams the onus shall be on the operator to prove that the proposed mitigative measures will provide an acceptable level of protection.

iii) The standards for diversions on other streams appear to be excessive, and should be modified accordingly.

F. Leave Strips

The Committee makes the following recommendation on Leave Strips:

i) Leave strips should only be required on A and B streams where the presence of the salmon resource has been proven and where the Department of Fisheries and Oceans can demonstrate the need for leave strips on a site specific basis.

6.5 Other Areas of Concern

During the course of its review of the proposed guidelines the Committee noted some other issues on which it wished to comment and make recommendations.

A. Prospecting

Prospecting is dealt with in the proposed guidelines under the section on the development plan which has been described in section 4, of this report. The Committee has endorsed the development plan provisions as being sound in principle. The Committee has noted, nowever, that there is no distinction made between an intensive evaluation program and a small scale general sampling and prospecting program. At present a person conducting a general prospecting program is required to have an authorization to use water for each and every site where he uses water in conjunction with his testing or sampling program. The Committee believes that this requirement is unreasonable. Such programs should be carried out under a seasonal and/or area permit that would authorize an individual's prospecting activities for the season. The granting of such a permit should be subject to the nature and size of the equipment to be used and the environmental sensitivity of the area to be prospected.

The Committee, therefore, recommends:

i) That the use of water in prospecting programs be carried out under a seasonal and/or area permit.

ii) That the terms of such permits be subject to the nature and size of the equipment to be used and the environmental sensitivity of the area being prospected.

B. Land Use Planning

The subject of land use planning was raised by a number of interveners both at the public hearings and in their written presentations. It was mentioned in conjunction with their concerns that the proposed guidelines do not adequately provide for the protection and management of all land and water based resources that are impacted by placer mining such as aesthetics, wilderness recreation, historic and archaeological sites, and forestry. They all agreed that the regulation of placer mining should be part of a much larger comprehensive land use planning process. The Federal Government representatives also endorsed this position.

It should be noted that during the discussions on the subject the operative term used was "land use planning", however, it was clear from the context of these discussions that most participants were talking about a form of "resource use", planning. It is the Committee's under-

standing that such a process is now being developed by the Federal and Yukon Governments.

The Committee, therefore, recommends:

i) That the regulation of placer mining should eventually be incorporated into a larger, more comprehensive, resource use planning process for Yukon.

ii) That policy and legislation developed through such a process should recognize and uphold the exemptions that have been recommended for existing operators but not beyond the twelve year period that the Committee has recommended.

C. Ground Sluicing

This subject was raised by several interveners in their presentations to the Committee. Ground sluicing is a well established industry practice which, stated simply, uses water to thaw and strip overburden. Although ground sluicing is not specifically dealt with in the proposed guidelines there has been concern expressed by miners about its prohibition. Although the Committee has no reason to believe that this is the government's intention, it has some observations and recommendations on the subject.

There is little doubt that ground sluicing, as it has been practiced by the industry in the past, is an unacceptable practice that produces major loadings of untreated effluent. There is also little doubt that it is a very cost effective method of thawing and stripping overburden.

In principle the Committee would not like to see a total prohibition of this practice. If miners are prepared to take appropriate mitigative measures then ground sluicing should continue to be permitted.

The Committee notes that the presence of perma-frost in Yukon placer mining creates some unique problems not found elsewhere. One problem is the difficulty of stabilizing this material after it has been stripped and stacked. The Committee believes it may be preferable to ground sluice during the spring freshet than to run the risk of having this material slough into the stream at more critical stages of the year.

The Committee, therefore, recommends:

i) That ground sluicing be permitted provided that operators meet the same effluent standards as required for their mining operation.

ii) That an appropriate portion of the organic material be kept for future use in rehabilitation.

iii) That the above conditions apply to both new and existing operators.

D. Assessment Work

To renew their placer claims, holders of such claims are required by the Yukon Placer Mining Act to do a minimum amount of work on their claims each year. This work is usually referred to in the industry as assessment work or more formally as "representation work". Current provisions require that a minimum of two hundred dollars ($200.00) per claim be spent on actual work on the claim sites each year.

Similar provisions apply to the holding of placer leases. In this case the minimum expenditure is one thousand dollars ($1,000.00) for each mile or fraction of a mile.

In the opinion of the Committee these provisions sometimes encourage needless and fruitless disturbance of the environment not only by the actual work on the claim or lease site themselves but probably more so by the disturbance created by the building of access roads.

Any disturbance of the environment by placer mining or its related and associated activities should only be encouraged and permitted when there is a bona fide effort being made to prospect, prove, or mine gold reserves. Disturbance of the environment simply for the sake of compliance with the terms of the Act is unacceptable by any standard.

The Committee, therefore recommends:

i) That placer claim owners and lease holders should have the option of making a cash payment instead of having to do the actual work of the same value on the property.

APPENDICES

APPENDIX A

TERMS OF REFERENCE

&

MEMBERS OF THE COMMITTEE

Terms of Reference for the Chairperson and Panel Members of the Placer Mining Guidelines Public Review Committee

Duties of Chairperson

The Chairperson will manage and conduct public hearings on the proposed draft guidelines for the Yukon Placer Mining Industry at key centres in the Yukon during the summer of 1983, the exact schedule to be determined by the Chairperson.

The panel will prepare a report following the public hearings for submission to the Minister of Indian and Northern Affairs, and through him to the Ministers of Fisheries and Oceans, and of Environment, during the summer of 1983. The Chairperson will be responsible for editing the report and ensuring that it represents the consensus reached by the panel.

The Chairperson's report will address the following:

- the principal concerns of various interest groups;
- the difficulties industry and other special interest groups anticipate if the proposed draft guidelines are promulgated and implemented without further amendment. The report should consider socio-economic considerations;
- recommendations for revisions to the draft guidelines with appropriate reasons;
- recommendations regarding the implementation schedule and other matters as may be pertinent.

Panel Members

Panel Members will provide support to the Chairperson in conducting the public hearings, providing advice and drafting the report.

It is intended that the panel members will provide a broad perspective and appreciation of the issues and assist the Chairperson in developing a well considered report and recommendation.

Terms of Reference Continued

Panel Members Continued

All members of the Review Committee will participate in the public hearings so that a free exchange of views and information is possible, but not in a manner which is highly formal or legalistic. The adversarial or cross-examinational mode should be discouraged by the Chairperson.

Other Considerations

The Panel will be permitted to retain independent professional advice as it feels necessary.

The Panel may consider it necessary to visit a few placer operations that are underway in the early summer of 1983. The Panel will be permitted to carry out such field work, with due consideration of costs and time.

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IONE J. CHRISTENSEN (MRS) - CHAIRPERSON

Born and raised in the North, Mrs. Christensen is a fourth generation Yukoner. Her great grandfather came to the Yukon with the gold rush in 1898.

Graduating with a degree in Business Administration in 1955 Mrs. Christensen has had a varied career. From 1959 to 1967 she had a variety of clerical and administrative positions with the Government of the Yukon. In 1971 she accepted the appointment of Justice of the Peace and Juvenile Judge which she held until 1975.

In 1975 Mrs. Christensen was elected Mayor of the City of Whitehorse and was re-elected in 1977. In January of 1979 she resigned to accept the appointment of Commissioner of the Yukon. When the role of Commissioner was changed in 1979 she resigned her appointment.

Since 1980 she has held the positions of Director, Petro Canada; Director, Pan Arctic Oil Ltd; and President of Hospitality North Ltd.

Mrs. Christensen sits on a number of national boards and local associations. Her hobbies are mainly outdoor activities - hiking, skiing, and photography.

DAVID A. ANDERSON - PANEL MEMBER

Mr. David Anderson, a native of Victoria, B.C. teaches at the University of Victoria. He has had extensive experience in resource evaluation, particularly with the Trans Alaska Pipeline and other port and pipeline proposals in British Columbia and Washington State. He was nominated to the Committee by the Minister of Fisheries and Oceans, the Honourable Pierre DeBane.

Mr. Anderson is bilingual - French and English. He has also passed the British Foreign Office (Higher Standard) examinations in Mandarin Chinese.

During his career Mr. Anderson has worked for the Department of External Affairs in Ottawa, and held posts as Assistant Canadian Government Trade Commissioner, Hong Kong, and Legal Advisor to the Canadian Commissioners on the International Supervisory and Control Commission in Indo China. Mr. Anderson has a degree in Economics and Law from the University of British Columbia.

In 1968 Mr. Anderson was elected as the federal Member of Parliament for Esquimalt-Saanich. In 1971 he established and chaired the special House of Commons Committee on Environmental Pollution. Mr. Anderson also served 3 years as the MLA for Victoria in the B.C. Legislature. He has represented the British Columbia Wildlife Federation on several energy related hearings before regulatory bodies in the U.S. and Canada.

Hobbies and interests of Mr. Anderson include hunting and fishing, sailing and skiing.

IVAN JOHN (JACK) CABLE, Q.C. - PANEL MEMBER

Mr. Jack Cable, born and raised in Hamilton, Ontario became a resident of the Yukon in 1970 when he moved to Whitehorse to practice law. Mr. Cable was appointed to the Panel by the Minister of Indian Affairs and Northern Development upon the recommendation of the mining industry.

Mr. Cable is a partner in the Whitehorse law firm of Cable, Veale, Cosco, Morris and Claxton as well he holds a B.Sc. in Chemical Engineering and an M.B.A.

Since 1980 Mr. Cable has been a Director of the Northern Canada Power Commission and he was appointed Queen's Counsel in 1983.

Hobbies and interests of Mr. Cable include swimming, racquetball and gardening.

KENNETH VERNON WEAGLE - PANEL MEMBER

Mr. Kenneth Weagle was born and raised in Bridgewater, Nova Scotia and came to the Yukon in 1974 with the Department of the Environment. Mr. Weagle was appointed to the Panel by the Minister of Indian Affairs and Northern Development upon the recommendation of the Government of the Yukon.

In 1980 Mr. Weagle formed his own private consulting firm - Ken Weagle Environmental Consulting Ltd.

Mr. Weagle is President of the Yukon Dog Mushers Association and a Director of the Yukon Sourdough Rendezvous Committee and the Whitehorse Sled Dog Club.

Hobbies and interests of Mr. Weagle include gardening and both recreational and competitive dog racing.

APPENDIX B

RULES & PROCEDURES

Yukon Placer Mining Guidelines
Public Review Process

Rules and Procedures
Revised August 1983

Purpose of Procedures

1. The Purpose of the Procedures are:
   i) to permit a Public Review of the proposed Yukon Placer Mining Guidelines by means of procedures which are efficient and fair;
   ii) to create an informal atmosphere, but with sufficient structure to provide useful results to participants and to the Committee;
   iii) to encourage cooperative and constructive discussion among participants.

Implementation

2. (1) These Procedures will be implemented so as to achieve the purposes set out in Procedure 1., and interpreted in a non-technical, common-sense manner.

(2) All procedural matters will be considered and decided by the Chairperson.

(3) Any time limit or any other provision of any Procedure may be varied by the Chairperson if she is satisfied that the purpose of these Procedures would better be achieved thereby.

Interpretation

(4) In these rules and procedures:

Rules and Procedures Continued

Interpretation Continued

"background paper" means ...

one of the four background papers to the proposed Yukon Placer Mining Guidelines - The Attainment and Cost of Placer Mining Effluent Guidelines; A Rationale for the Classification of Rivers, Streams and Lakes in the Yukon Territory in Relationship to the Placer Mining Guidelines; A Rationale for the Suspended Solids Standards for Yukon Streams Subject to Placer Mining; Socio-Economic Impact Analysis for Yukon Placer Mining Guidelines;

"the committee" means ...

the Yukon Placer Mining Guidelines Public Review Committee;

"participant" means ...

a registered intervener, a member of the Interdepartmental Committee on Placer Mining (ICPM), or a member of the public;

"registered intervener" means ...

any individual, organization or other body who files a notice of intent to intervene pursuant to Section 13;

Rules and Procedures Continued

Interpretation Continued

"technical session" means...

those sessions during which the Committee will hear presentations on the background papers and technical matters directly related to the proposed Yukon Placer Mining Guidelines;

"ICPM" means...

the Interdepartmental Committee on Placer Mining which is the Committee that prepared the proposed Yukon Placer Mining Guidelines. It is comprised of officials from the Department of Indian Affairs and Northern Development, the Department of the Environment and the Department of Fisheries and Oceans.

Tone and Style

3. Participants will be required to present their views or questions in a tone and style that is courteous to and respectful of others.

Communications

4. (1) Other than at Sessions, all communications on substantive issues associated with the Review Process are to be conducted through the Office of the Executive Secretary.

(2) Communications with Committee members about purely procedural matters need not be reported.

Openness and Public File

5. (1) All proceedings of the Committee will be conducted openly and publicly, with the sole exception of confidential deliberations of the Committee and Staff.

(2) A Public File for examination by any member of the public will be kept at the Office of the Executive Secretary and an Index of the Public File will be available at the public sessions.

(3) Information pertaining to the substance of the Review Process submitted to the Committee by any of the participants will be made public by placement in the Public File, or otherwise, as may be ordered by the Chairperson.

(4) Copies of correspondence relating to the Committee Review Process and to matters of procedure will be placed in the Public File.

(5) Any submission (other than those at a Public Session) must be in writing, and thirty (30) copies of the submission must be provided to the Committee.

Rules and Procedures Continued

Technical Specialists

6. (1) The Committee may retain persons specialized in various disciplines as Technical Specialists.

(2) Any participant may request a consultation with a Technical Specialist through the Executive Secretary.

(3) Consultations will be limited to advice only, as it is not the function of Technical Specialists to prepare the submissions of participants.

Public Sessions

7. (1) The public meetings to be held by the Committee will be of three kinds:

i) General Sessions for Registered Interveners;
ii) General Sessions for the Public;
iii) Technical Sessions for Registered Interveners.

(2) General Sessions for the public are intended to be informal and non technical to permit members of the public to provide their views to the Committee.

(3) Sessions for the Registered Interveners will be more structured.

Legal Formalities Not to Apply

8. (1) Court-like procedures will not be followed at the Sessions and therefore it will not be necessary to retain legal counsel.

Rules and Procedures Continued

Legal Formalities Not to Apply Continued

(2) Participants will not be required to swear any formal oath or to make any affirmation to tell the truth.

Limitation of Discussion

9. The Chairperson may exercise her discretion to limit or exclude questions or comments which fall outside of the mandate of the Committee, are needlessly repetitive, or are irrelevant or immaterial.

Sessions Notices

10. These Procedures are of general application but, from time to time, the Chairperson may issue Session Notices setting out the dates, times and locations of Public Sessions, and may vary these rules, or their application, as she considers necessary.

Notices

11. A notice setting out forthcoming Sessions will be made available and will be released at least fourteen (14) days before Sessions and will be advertised on radio and in newspapers.

Interpreters

12. Interpreters will be provided at all Sessions if considered necessary by the Committee. Requests for such services should be made to the Executive Secretary three (3) weeks in advance of the Sessions to ensure that arrangements can be made.

Rules and Procedures Continued

Registration of Interveners

13. (1) Any individual, organization or other body may become a registered intervener.

(2) To become a registered intervener interested parties should give notice in writing to the Executive Secretary of their intention to be a registered intervener. This notice should be given by August 16, 1983.

(3) Interested parties will be deemed to be registered interveners when so notified in writing by the Executive Secretary.

(4) Such parties should indicate the preferred date and place that they wish to make their presentation.

Registration of Members of the Public

14. (1) Members of the public should indicate their intention to appear before the Committee to the Executive Secretary.

(2) Members of the public should indicate the time and place that they wish to make their presentation and should also indicate the general nature of their presentation (i.e. question for one of the participants; a statement of specific or general concern; some information for the Committee's consideration; etc.).

Rules and Procedures Continued

Registration of Members of the Public Continued

(3) This notice may be in writing or may be given verbally (the public's choice) and shall be given to the Executive Secretary.

(4) This notice shall be given to the Executive Secretary immediately prior to the opening of the Session on the day they wish to make their presentation.

(5) If time permits the Chairperson may allow registration after the opening of the Session.

Filing of Presentations

15. (1) All presentations to the Committee must be filed with the Executive Secretary.

(2) In the case of presentations to be made by registered interveners and the ICPM such presentations must be in written form and thirty (30) copies must be provided for distribution to each of the other interveners or participants. The Committee will distribute a copy of each submission to each registered intervener and the ICPM.

(3) Presentations to be made by registered interveners and the ICPM must be filed with the Executive Secretary no later than 12:00 o'clock noon August 22, 1983.

Rules and Procedures Continued

Filing of Presentations Continued

(4) Persons other than registered interveners will be deemed to have filed their presentation when they give notice of their intention to appear before the Committee in the manner outlined in Paragraph 14.(2) (3) and (4).

Office of the Executive Secretary

16. The Office of the Executive Secretary of the Yukon Placer Mining Guidelines Public Review Committee is located at 208B Main Street, Whitehorse, Y.T. Y1A 2A9.

Scheduling of Presentations

17. (1) The Chairperson will determine the order in which all presentations will be heard.

(2) The Chairperson will make every reasonable effort to schedule presentations at the date and place requested by participants.

(3) The Chairperson may grant request for changes to the scheduling of presentations.

(4) During the general sessions for the public the presentations will be heard in the order in which they were registered (first come, first served).

Time Limits - General Session for Registered Interveners

18. (1) Each registered intervener and the ICPM will be allowed a maximum of one (1) hour for their presentations.

Rules and Procedures Continued

Time Limits - General Session for Registered Interveners Continued

(2) A one (1) hour question period will follow each presentation during which the interveners and the ICPM may question each other or be questioned by the Committee.

Time Limits - General Session for the Public

19. Each member of the public who has registered to appear before the Committee will have a maximum of thirty (30) minutes for their presentation and/or questions.

Time Limits - Technical Sessions for Registered Interveners

20. (1) The ICPM will be allowed a maximum of one (1) hour to make a presentation on Yukon Placer Mining Guidelines and each of the background papers (one hour maximum per presentation).

(2) The presentation by the ICPM and the question period to follow will not exceed a total of three (3) hours for each presentation.

Procedures to be Followed at General Sessions for Registered Interveners

21. (1) The Chairperson will open each day of the session with introductory remarks and will outline the rules and procedures that will govern the session.

(2) The ICPM will make a presentation on the proposed Yukon Placer Mining Guidelines on the first day of the session in each community.

Rules and Procedures Continued

Procedures to be Followed at General Sessions for Registered Interveners Continued

(3) A question period will then follow (Section 24).

(4) The first scheduled intervener will then make their presentation with a question period to follow.

(5) The other scheduled interveners will follow in turn with their presentations and the subsequent question period.

Procedures to be Followed at General Sessions for the Public

22. (1) The Chairperson will open each day of each session with introductory remarks and will outline the rules and procedures that will govern the session.

(2) The ICPM will make a short presentation on the proposed Yukon Placer Mining Guidelines at the beginning of each day of each session.

(3) Once the ICPM have concluded their presentation the floor will be open for presentations from the public.

Procedures to be Followed at Technical Sessions for the Registered Interveners

23. (1) The Chairperson will open each day of each session with introductory remarks and will outline the rules and procedures that will govern the session.

(2) The ICPM will then make a presentation on the proposed Yukon Placer Mining Guidelines and the background papers according to the schedule established for that day.

Rules and Procedures Continued

Procedures to be Followed at Technical Sessions for the Registered Interveners Continued

(3) Following each presentation by the ICPM there will be a question period during which all registered interveners may question the ICPM and be questioned by them.

Questioning

24. (1) The Committee may question any participant at any time during the session.

(2) During the General and Technical Sessions for Registered Interveners, only Registered Interveners, the ICPM and the Committee may participate in the question periods.

(3) The Chairperson will establish the order in which the interveners will be allowed to ask questions and may vary the order of questioning as she deems necessary.

(4) During general sessions for the public, members of the public may use some or all of their allotted thirty (30) minutes (Section 19) to question the ICPM.

Concluding Statement to Presentation

25. (1) Registered Interveners and the ICPM may make a final concluding statement to their presentation at a session to be convened for the purpose of hearing such statements.

Rules and Procedures Continued

Concluding Statement to Presentation Continued

(2) These concluding statements should be summary in nature and are designed to provide the interveners and the ICPM with the opportunity to make final comments on the evidence that has been put on the public record of the Review Process. The Committee will not consider any new evidence.

(3) The time, date and location of the session to be convened to hear the concluding statements will be set by the Chairperson.

Transcripts

26. Transcripts of the sessions will be available at cost. There will be two (2) copies of the transcript in the public file at the Committee Office.

APPENDIX C

LIST OF - REGISTERED INTERVENERS
- ICPM
- MEMBERS OF THE PUBLIC & ORGANIZATIONS

REGISTERED INTERVENERS

Association of Yukon Communities
Mr. Andre Carrel

Canada Tungsten Mining Corporation Limited
Mr. Mervyn Coffin

Churchill Placers Limited
Mr. John Hoyt

Cogasa Mining Corporation
Mr. Des Clarke

Finning Tractor and Equipment Company Limited
Mr. David Horner

Government of the Yukon Territory
Mr. Peter Fairman - Department of Economic Development
Mr. Rod Hill - Department of Economic Development
Mr. Howard Paish - Depatment of Renewable Resources

Klondike Placer Miners' Association
Mr. Lowell Bleiler
Dr. Thomas C. Griffing
Dr. Nick Poushinsky
Mr. Norman Ross
Mr. John T. Steeves, Q.C.

Mayo Local Improvement District
Mr. Stephen Goodliffe

Queenstake Resources
Mr. Gordon Gutrath

Stutter, Mike

REGISTERED INTERVENERS CONTINUED

Tamandara Resources
Mr. E. F. Weiz

Total North Communications
Mr. Gordon Duncan

Trans North Turbo Air
Mr. Al Kapty

Whitehorse Chamber of Commerce
Mr. Pat Dixon

Yukon Association of Wilderness Guides
Mr. Hector MacKenzie
Mr. Martin Williams

Yukon Chamber of Mines
Mr. Walt Lengerke
Mr. Dennis Prince

Yukon Conservation Society

Mr. Tony Hodge
Dr. Gail Cook Johnson
Mr. Andrew Roman
Mr. Lindsay Staples

Yukon Historical & Museums Association
Mr. Jeff Hunston

Yukon Insurance Association
Mr. Doug Ross

Yukon Liberal Party
Mr. Ron Veale

REGISTERED INTERVENERS CONTINUED

Yukon New Democratic Party
Mr. Piers MacDonald

Yukon Order of Pioneers - Lodge # 2
Mr. Lloyd Ryder

Yukon Territorial Progressive Conservative Party
Mr. Don MacDonald

Yukon Transportation Association
Mr. Jerry Mitchell

Yukon Voyageurs Canoe & Kayak Club
Mr. Peter Hayes
Mr. Mel Orecklen

Zeiler, Mel

ELECTED OFFICIALS

Government of the Yukon Territory

Government Leader	Mr. Chris Pearson
Ministers	Mr. Clarke Ashley Department of Justice
	Mrs. Bea Firth Department of Tourism, Hertiage & Cultural Resources
	Mr. Dan Lang Department of Economic Development & Intergovernmental Relations
	Mr. Howard Tracey Department of Renewable Resources
Members of Legislative Assembly	Mr. Bill Brewster Kluane
	Mr. Al Falle Hootalinqua
	Mr. Piers MacDonald Mayo-Keno

Municipal

City of Dawson	Mr. Peter Jenkins Mayor

ELECTED OFFICIALS CONTINUED

Local Improvement Districts

Carmacks	Mr. R. Coles, Jr. Elected Member of the Board
Mayo	Mr. Stephen Goodliffe Elected Member of the Board

INTERGOVERNMENTAL COMMITTEE ON PLACER MINING (ICPM)

Department of Indian Affairs & Northern Development	Mr. Denis Watson - Chairman
Department of Fisheries & Oceans	Mr. Fred Fraser
Department of the Environment	Mr. Colin Wykes

Support Staff

Mr. Peter	Caskey	Director General of Environmental Strategies Directorate
Mr. Paul	Kopas	Habitat Economist
Mr. Serge	Langdeau	Commercial Analyst
Mr. Otto	Langer	Senior Habitat Management Biologist
Mr. Rob	Morley	International Advisor
Mr. Rob	McCandless	Manager Environmental Assessments & Appraisals for Yukon Branch
Mr. Steve	MacFarlane	Senior Project Manager in the Habitat Management Group
Mr. Jack	Nickel	Regional Manager, Water Resources
Mr. Kim	Roberts	Legal Counsel
Mr. John	Thompson	Senior Resource Economist for Canadian Resourcecon

Consultants

Mr. Marvin	Shaffer	Marvin Shaffer & Associates

PERSONS OR ORGANIZATIONS MAKING PRESENTATIONS AT PUBLIC HEARINGS

WHITEHORSE

Mr. Roy Pawluk
Mr. Mike Laforet
Mr. Mel Holloway
Mr. Mel Zeiler
Mrs. Linette Bleiler
Ms. Nancy Hanna
Mr. Doug Baird
Mr. Reg Therrian
Ms. Elizabeth Innes-Taylor
Mr. Al Falle
Mr. Tim Pyake
Mr. Ron Holway

CARMACKS

Carmacks Local Improvement District
Mr. Bob Coles Sr.
Mr. Ron Grainger
Mr. Gary Lee

Government of the Yukon Territory
Dept. of Renewable Resources
Mr. R. Coles Jr.
Mr. Bob McCaully

DESTRUCTION BAY

Mr. Bill Brewster M.L.A.
Mr. Brian Bjork
Mr. Darrel Duensing
Mr. Heinz Eckervogt
Mr. Bill Addison
Mr. Randy Rogers
Mr. Ticiniski
Mr. Ted Yardley
Mr. Lucky Jackson
Mr. Trembly
Mr. Eikland
Mr. Chris Modersohn

MAYO

Mr. Lowell Bleiler
Mr. Bert Liske
Mr. David Flick
Mr. Jim Carmichael
Mr. Simon Mason-Wood
Mr. W. Joris Brinkerhoff
Mr. Greg Peterson
Ms. Linda MacDonald
Ms. Joyce Ronaghan
Ms. Ina-Mae Klippert

PERSONS OR ORGANIZATIONS MAKING PRESENTATIONS AT PUBLIC HEARINGS CONTINUED

MAYO CONTINUED

Mrs. Lynn Bleiler
Mr. Frank Taylor
Mayo Historical Society
Mr. Herb Davies
Mr. Hans Barchen
Mr. Gary Hosack
Mr. Leo Wozniak
Mr. Mel Zeiler
Mayo Indian Band
Mr. Gordon
Mrs. Holly Hosack
Mrs. Bonnie Taylor
Mr. Ralph Barchen
Mr. Dan Klippert

DAWSON CITY

Government of the Yukon Territory - Dept. of Justice
Universal Explorations
Mr. Robert Truswell
Mr. R. Truswell
Energy Exploration Limited
Granville Joint Ventures
Mr. William Bowie
Mr. Lorne Ross
Mr. Hank Foster
Mr. Art Sailor
Mrs. Joan Kerr
Mr. Al Close
Mr. Jack Fraser
Mr. Murray Crockett
Mr. Eric Rauguth
Mr. Jim Archibald
Mr. Ron Johnson
Mrs. Judy Schmidt
Mr. Mark Mather
City of Dawson
Eldorado Placers Oro Enterprises & Hakon Enterprises
Mr. Frank Taylor
Mr. Bill McCarter
Mr. Stewart Schmidt
Ballarat-Tatlow Joint Ventures
Klondike Visitors' Association
Yukon Order of Pioneers, Lodge #1
Mrs. Paula Ross
Mr. Jeff Lerner
Mrs. Marion Schmidt
Mr. George Shaw
Mrs. Barbara Hanulik
Dr. Mike Johnson
Mr. John Gould
Mr. Fred Berger
Mr. Len Miller
Mr. Bern Johnson
Mrs. Mona Sprockreeve
Mr. Earl McKenzie

PERSONS OR ORGANIZATIONS MAKING PRESENTATIONS AT PUBLIC HEARINGS CONTINUED

DAWSON CITY CONTINUED

Mr. Roger Mendohlson
Mr. Mark Smith
Mr. Chris Weinert
Mr. John Schmidt
Mr. Bernie Walter
Mr. Dietmar Gritsky

APPENDIX D

LIST OF REPORTS & PAPERS PREPARED FOR THE HEARINGS

LIST OF REPORTS & PAPERS PRESENTED TO REVIEW COMMITTEE

ICPM

- Draft Yukon Placer Mining Guidelines

  Errata and Points of Clarification to supplement Draft Yukon Placer Mining Guidelines. Letter of June 9, 1983 from ICPM

- A Rationale for the Suspended Solids Standards for Yukon Streams Subject to Placer Mining

- A Rationale for the Classification of Rivers Streams and Lakes in the Yukon Territory in Relationship to the Placer Mining Guidelines

- The Attainment and Cost of Placer Mining Effluent Guidelines

- The Use of Flocculants in Placer Mining

  A Supplement to the paper "Attainment and Cost of Placer Mining Effluent Guidelines"

- Socioeconomic Impact Analysis for Yukon Placer Mining Guidelines

- Benefit-Cost Analysis of the Proposed Yukon Placer Mining Guidelines

REGISTERED INTERVENERS

- Association of Yukon Communities

- Canada Tungsten Mining Corporation Limited

- Churchill Placers Limited

LIST OF REPORTS & PAPERS PRESENTED TO REVIEW COMMITTEE CONTINUED

REGISTERED INTERVENERS CONTINUED

- Cogasa Mining Corporation
- Finning Tractor and Equipment Company Limited
- Government of the Yukon Territory
  - Regulation of Placer Mining: Yukon Government Position
- Klondike Placer Miners Association
  - IEC Beak Report
- Mayo Local Improvement District
- Queenstake Resources
- Stutter, Mike
- Tamandara Resources
- Total North Communications
- Trans North Turbo Air
- Whitehorse Chamber of Commerce
- Yukon Association of Wilderness Guides
- Yukon Chamber of Mines
- Yukon Conservation Society
  - Discussion of Benefit Cost Analysis of Yukon Placer Mining Guidelines

LIST OF REPORTS & PAPERS PRESENTED TO REVIEW COMMITTEE CONTINUED

REGISTERED INTERVENERS CONTINUED

- Yukon Conservation Society Continued
  - Intervention Statement
  - Legal Opinion on the Draft Placer Mining Guidelines
- Yukon Historical & Museums Association
- Yukon Insurance Association
- Yukon Liberal Party
- Yukon New Democratic Party
- Yukon Order of Pioneers - Lodge #2
- Yukon Territorial Progressive Conservative Party
- Yukon Transportation Association
- Yukon Voyageurs Canoe & Kayak Club
- Zeiler, Mel

APPENDIX E

DPA CONSULTING SUMMARY

SUMMARY OF ANALYSIS OF ECONOMIC REPORTS FOR YUKON PLACER MINING GUIDELINES PUBLIC REVIEW COMMITTEE

FINAL REPORT

Prepared for:
Yukon Placer Mining
Guidelines Public Review Committee

Prepared by:
DPA Consulting Limited

November, 1983

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2.0 Comparison of Benefit-Cost Analyses

3.0 Comparison of Socioeconomic Impact Analyses

4.0 General Issues of Economic Methodology

5.0 Summary Review and Comments

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Table 2.2.1 Summary of Principal Assumptions: Mining
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Table 3.1 Summary of Principal Assumptions and Data Sources for Impact Effects
Table 3.2 Summary of Impact Effects

1.0 INTRODUCTION

DPA Consulting Limited was retained by the Yukon Placer Mining Guidelines Public Review committee to provide a summary review of four documents presented at the Public Hearings of the above committee. These documents are:

- Socioeconomic Impact Analysis for Yukon Placer Mining Guidelines prepared by the Department of Environment,
- "Yukon Placer Mining Guidelines", prepared for the Department of Fisheries and Oceans by Marvin Shaffer and Associates Ltd.,
- An Assessment of the Proposed Yukon Placer Mining Guidelines prepared for Klondike Placer Miners Association by IEC Beak Consultants Ltd.,
- Discussion of Benefit-Cost Analysis of Yukon Placer Mining Guidelines, prepared by R.K. House and Associates Ltd. for the Yukon Conservation Society.

The terms of reference for the assignment requested the following:

(a) a review of the four documents

(b) a comparison of the four documents which delineated the areas of agreement and disagreement among the documents according to
    - data used
    - assumptions
    - methodology
    - conclusions
    - benefit-cost ratios.

(c) a compilation of findings in a clear and concise tabular format.

It was furthermore requested that the summary review shall not introduce or consider additional data beyond what are contained in the four documents, and shall not make any assessment of the relative credibility and/or value of the documents.

Our work involved a review of the above documents and extracts of the hearing transcripts in which the "four documents" were presented and discussed. No extensive consultation with the authors of each of the studies were carried out.

Section 2 provides summary tables which depict the main differences and similarities among the benefit-cost studies in terms of data used, assumptions, methodologies and conclusions. Additional tables in Section 2.3 provide a comparative analysis of the values assigned in each report to the principal benefit and cost components.

Section 3 provides tables which display the differences and similarities between the two socioeconomic impact analyses contained in the original DOE submission and the KPMA study.

Section 4 provides a discussion of several economic methodology issues which were frequently raised during the hearings. We thought it would be helpful to try to clarify some of the issues as a possible aid to the Panel.

Section 5 provides a summary review and concluding comments. It highlights the differences among the reports which were identified in each of the tables in Sections 2 and 3.

2.0 COMPARISON OF BENEFIT-COST ANALYSES

Four benefit-cost analyses were presented to the Placer Mining Guidelines Public Review Committee. These were:

- Socioeconomic Impact Analysis for Yukon Placer Mining Guidelines, prepared by the Department of the Environment (referred to here as the SEIA).

- Benefit/Cost Analysis of the Proposed Placer Mining Guidelines, prepared by Marvin Shaffer & Associates Ltd. (referred to here as the Shaffer report).

- An Assessment of the Proposed Yukon Placer Mining Guidelines, prepared by IEC/Beak Consultants Ltd. (referred to here as the KPMA report).

- Discussion of Benefit-Cost Analysis of Yukon Placer Mining Guidelines, prepared by RK House & Associates Ltd. (referred to here as the RK House report).

The results from the studies vary significantly, with benefit-cost ratios ranging from 0.03 to 1.55.[1]

This section focuses on identifying and summarizing the similarities and differences between the four reports. The section is divided into three sets of tables. A tabular form of presentation has been chosed at the request of the Review Committee and also so that principal similarities and differences can be easily identified. A more general discussion of key differences among the reports is presented in Section 5.

The first set of tables presents the data sources which were used in the four reports -- Table 2.1.1 refers to mining; Table 2.1.2 refers to fisheries.

The second set of tables details assumptions underlying the

estimates of mining costs (Table 2.2.1) and fisheries benefits (Table 2.2.2). These tables incorporate differences in methodology which, in general, are difficult to clearly separate from assumptions. Table 2.2.3 lists the non-quantified effects of the guidelines in a number of other economic sectors.

The third set of tables presents the "bottom line" benefit-cost results. Table 2.3.1 compares estimates for benefits, costs, net benefits, and benefit-cost ratios. Table 2.3.2 lists the results from various senstivity tests, and Table 2.3.3 details the estimates of benefits and costs on an i em by item basis using the high gold price scenario for illustrative purposes.

For ease of comparison, the following organizational changes were made to the respective studies:

- The optimistic fisheries scenario, as presented in the SEIA report, is considered as a senstivity test, rather than a base case scenario.

- Different levels of foreign withdrawals of net costs and different equations for forecasting gold production levels are considered as a set of base cases for the RK House report. Other variations in assumptions are treated as sensitivity tests. We perceive that this report attempts to highlight the potential variability in benefit-cost results and their sensitivity to a number of different factors. However, we have chosen this form of presentation for the RK House report to facilitate comparisons with the SEIA, Shaffer, and KPMA studies.

FOOTNOTES

1. Assumes a 10% discount rate and includes results from sensitivity tests.

TABLE 2.1.1: DATA SOURCES: MINING

Item	SEIA	Shaffer	KPMA	RK House
1. gold prices	historical data: U.S. Dept of Commerce (Bureau of Economic Analysis)	SEIA: Peter Cavelti, Northern Miner, Feb 11, 1982: and Dow Theory letter, No. 851, Dec 29, 1982, pg.6	Shaffer	Shaffer
2. gold production forecast	historical data: gold prices - see above gold production - Mining Record, DIAND: Mineral Policy Sector, EM&R Canada: Statistics Canada: Northern Resources & Economic Planning, DIAND, Ottawa	SEIA	SEIA	SEIA
3. production costs	not calculated	Miller, M.E. & Assoc. Ltd., Impact on the Yukon Economy of the Gold Placer Mining Industry. Prepared for the KPMA, Feb. 1981 and survey undertaken by Shaffer & Associates of industry contacts and specialists	Shaffer	Shaffer
4. decrease in production due to guidelines	data for risk model: DFO maps of creek classification and DIAND staff (Jack Nikel, Ruth Debicki & George Gilbert)	SEIA	KPMA compliance cost estimates; DFO stream classification maps: Shaffer production cost estimates	SEIA
5. number of operations or average size of operation	historical data on no. of operations: Miller, ME & Associates Ltd., Impact on the Yukon Economy of the Gold Placer Mining Industry, Prepared for KPMA, 1979	Miller, ME & Associates Ltd., Impact on the Yukon Economy of the Gold Placer Mining Industry. Prepared for the KPMA, Feb 1981	Shaffer	Shaffer
6. compliance costs	DOE & DFO, The Attainment & Cost of Placer Mining Effluent Guidelines (Technical Brief): miners' applications for water authorizations	SEIA	DeLeeuw (1981); Hough (1989); BC Waste Management Branch (1980); 1982 Caterpillar Performance Handbook; R&M Consultants (1982); Sigma Resources Consultants (1981)[a] and various industry technical reports	SEIA

a. see KPMA Report for full bibliographies

TABLE 2.1.2: DATA SOURCES: FISHERIES

Item	SEIA	Shaffer	KPMA	RK House
1. wholesale prices & estimation of values				
- salmon	unspecified	SEIA	SEIA	SEIA
- freshwater	unspecified	SEIA	SEIA	
- sport fishery				
- resident	Masse & Peterson, Evaluation of Incremental Recreational Benefits for Salmonid Enhancement SEP, March 1977 and Quadra Economic Consultants Ltd., Fish & Wildlife in BC: A Review of Resource Values Prepared for BC Fish & Wildlife Branch, 1977	SEIA sources (reinterpreted)	Shaffer Shaffer	Shaffer Shaffer
- non-resident	DFO, 1980 Survey of Sportfishing in Canada Final Results and unspecified	Marvin Shaffer & Assoc. Ltd., The Economic Impact of Resident Sport Fishing in BC (1982); and SEIA	Shaffer	Shaffer
2. production costs	not calculated	DFO benefit-cost analyses for Salmonid Enhancement Program	Shaffer	Shaffer
3. fish production estimates	DFO Annual Narrative, Yukon Arctic Sub-District, Alsek-Taku Sub-District, & Northern BC-Yukon South Sub-District (1982); DFO, unpublished memorandum (1982); DFO unpublished memorandum (1983); DFO, unpublished 1980 survey data (1980); and unspecified	SEIA	SEIA	SEIA
4. physical impact of guidelines	"A Rationale for the Suspended Solids Standards for Yukon Streams Subject to Placer Mining", Langer (1980); Hall & MacKay (1982); Mathers, West & Burns (1981)[a]	SEIA	SEIA	SEIA
5. impact on angling effort for sport fishing	Canadian Resourcecon (1982); Paish (1981)[a]	SEIA	SEIA	SEIA
6. Canadian fish credits	unspecified	existing treaty arrangements	Shaffer	Shaffer
7. timing & duration of benefits	not specified	SEIA	unspecified	SEIA

a. See SEIA Report for full bibliography.

TABLE 2.2.1: SUMMARY OF PRINCIPAL ASSUMPTIONS: MINING

Item	SEIA	Shaffer	KPMA	RK House
1. price of gold (1983$Can/troy oz)	low 412.5 / high 875	low 412.5 / medium 500 / high 875	low 412.5 / medium 500 / high 875	low 412.5 / medium* 500 / high 875
2. gold production forecast[a]	regression model: Y_i=-18,392 + 180x_{i-1}	same as SEIA	Same as SEIA	regression models: *Y_i=-18,392 + 180x_{i-1}; Y_i= 5,342 + 164x_{i-1}; Y_i=-13,833 + 124x_i
3. production costs	not estimated: estimations are based on gross rather than net values	80% of price	80% of price	80% of price
4. decrease in production due to guidelines[b]	16% reduction in no. of operations (based on risk model) resulting in 16% fall in production	16%	44% (based on the assumption that all operations who must comply with the 0mg/l & 100mg/l levels would have to close down)	16%
5. average production (troy oz) per operation[c]	200-286 (implied)	365	365	365
6. settling pond costs[d]	average cost/operation: $600-$5100; mid point $3350 (prorated for average flow rate; represents incremental costs which are assumed to be 30%-60% of construction costs)	average cost/operation: $1890-$7130; mid point $4150 (same methodology as SEIA, but calculation yielded different values)	average cost/operation: $14600 (includes maintenance costs of 50% of capital costs per year; assumes all remaining operations must comply with 1000mg/l levels [see (4)])	Same as Shaffer
7. rehabilitation costs	average cost/yd: $.33 (implied) average cost/operation: $1984-$2976 (500,000-750,000 ft^2 requires 10cm of topsoil)	average cost/yd: $.33 average cost/operation: $1913-$3238	average cost/yd: $ .22 average cost/operation: $4400 ($1y^3$ of paydirt requires $2y^2$ of surface disturbance)	Same as Shaffer
8. recontouring costs	average cost/operation: $6000-$12000; mid point $9000 (based on assumptions that cost of operator & equipment is $89-$174/hr & 70 hrs are required)	average cost/operation: $6230-$12180; mid point $9205 (same as SEIA, without rounding)	average cost/operation: $21500 (based on average 5:1 ratio of overburden to paydirt)	Same as Shaffer
9. diversions	average cost/operation: $2500-$10000; mid point $6250 (includes design costs only; construction costs not estimated) 7.5% of operations affected	same as SEIA	0 (diversions are required to meet 100mg/l level only who are all assumed to leave the industry [see (4)]).	Same as SEIA
10. development plans	not quantified	not quantified	$1300/operation every 10 years	not quantified
11. increased capital	0	0	total cost to industry: $79000-$470400/yr (1.4% of total costs based on assumption that construction of ponds reduces sluicing time by 11%)	0
12. net revenues leaving the country	0	not quantified	0	reduced net costs by 0%-75% (these values were arbitrarily chosen for lack of data, to indicate the potential impact on costs)
13. discount period	13 years	13 years	13 years	13 years

a. Y = production of gold in troy ounces
x = price of gold in $US 1981
i = current year
i-1 = previous year

b. Differences in assumptions regarding production levels impact on compliance costs.
SEIA : Estimates from the risk model varied from 16% to 28%. The 16% was chosen.
KPMA : Based on compliance cost estimates and assumptions of a 20% after-costs profit margin.

c. Differences in assumptions regarding average output per operation affect total compliance costs. Total costs to the industry are calculated as: average costs to each operation times number of operations. The number of operations (with the guidelines) are, in turn, calculated from production estimates and average output per operation, except in the SEIA model where the number of operations with the guidelines are taken as a straight 16% decrease from pre-guidelines estimates.

d. IEC-Beak assumptions regarding cost of capital and labour also differ from those used by SEIA, Shaffer, and RK House (e.g., bulldozers operate at 20% vs 50% efficiency; settlement time for 100mg/l standard is 50 hrs vs 10 hrs).

TABLE 2.2.2: SUMMARY OF PRINCIPAL ASSUMPTIONS: FISHERIES

Item	SEIA	Shaffer	KPMA	RK House
1. wholesale prices of and estimations of values[a]	salmon: commercial $4.61/kg food $4.77/kg freshwater: commercial $4.88/kg food $3.23/kg sport fishery: resident $15/day non-resident $72/day	Same as SEIA Same as SEIA sport fishery: resident $20/day non-resident $116/day	same as SEIA same as SEIA same as Shaffer	same as SEIA same as SEIA same as Shaffer
2. production costs[b] (incremental harvesting & processing costs)	not estimated - gross values calculated with wholesale prices	35% of wholesale values yielding net price of: salmon: commercial $3.00/kg food $3.10/kg freshwater: commercial $2.65/kg food $2.10/kg	same as Shaffer	same as Shaffer
3. fish production[c] forecast	2 scenarios developed: Status quo: production levels of both salmon & freshwater species remain at current level Optimistic: current production levels for both species double	1 scenario only: current production levels maintained (status quo)	same as Shaffer	same as Shaffer
4. physical impacts[d] of guidelines on stock levels	low gold price / high gold price	low gold price / high gold price		
salmon rehabilitation protection total	10.0% / 10% 2.5% / 5% 12.5% / 15%	10.0% / 10% 2.5% / 5% 12.5% / 15%	same as Shaffer	same as Shaffer
freshwater rehabilitation protection total	5.0% / 5% 2.5% / 5% 7.5% / 10%	5.0% / 5% 2.5% / 5% 7.5% / 10%		
5. allocation to user group - incremental impacts on production & effort levels	low gold price / high gold price	low/med. gold price / high gold price		
salmon (kg) commercial food interntional[e]	12.5% / 15.0% 12.5% / 15.0% not incl.in B/C calcul.	12.5% / 15.0% 12.5% / 15.0% 12.5% / 15.0%	same as Shaffer	same as Shaffer
freshwater (kg) commercial food[f]	7.5% / 10.0% 0 / 0	7.5% / 10.0% 7.5% / 10.0%		
sport (angler days) Canadian Non-Canadian	1.5%-2.0% / 1.5%-2.0% 1.5%-2.0% / 1.5%-2.0%	1.5%-2.0% / 1.5%-2.0% 1.5%-2.0% / 1.5%-2.0%		
6. Canadian fish[g] credits (from increased Alaskan catches)	Credits are discussed, but a value for them does not appear to have been included in base case benefit/cost calculations	31.25% of incremental international catch	same as Shaffer	same as Shaffer
7. delay in benefits rehabilitation benefits	0	0	4 years, based on the length of the cycle (assumed to be the same for freshwater & salmon species)	0
protection benefits	0	0	14 years based on an additional delay of 10 years before new areas are exploited for placer mining activities	
8. duration of benefits[h] (rehabilitation & protecton benefits)	perpetuity	perpetuity	17 years	perpetuity

... continued

NOTES:

a. Wholesale prices for salmon and freshwater fish do not appear to be specified in the text of the SEIA report. They are, therefore, derived from Shaffer's assumptions on cost of harvesting and net-of-cost price estimates. Shaffer uses a higher willingness-to-pay estimate for the resident sport fishery on the basis that the SEIA estimate "appears conservative in light of the review of studies cited in that report". The non-resident value is based on incremental income generated, rather than incremental gross expenditures as used in the SEIA model. The income approach was chosen as non-resident expenditures have spinoff or multiplier effects through the economy (e.g., a certain percentage of gross expenditures constitute wages and salaries for Yukon residents which is respent on consumer items, thereby generating a second round of employment and income). Shaffer estimates that $1.60 in income is generated per dollar of expenditures.

b. Sport fishery values use a willingness-to-pay measure which is an estimate of net benefits and, therefore, is not affected by the cost modification discussed in this item.

c. To facilitate comparison of base case benefit/cost results, the optimistic scenario is treated as a sensitivity test in this report.

d. Salmon rehabilitation impacts consist of 2 components:
   - sedimentation and direct disturbance from existing placer operations which currently affect spawning areas (5%); and
   - downstream suspended sediments due to existing placer activity which increase mortality of migrating fry and adults (5%). Freshwater species are affected by the first component (sedimentation of spawning grounds) only.

   Protection benefits for both species refer to new areas whihc would be affected by future placer activity. This was assumed, under the high gold price scenario, to be equal to the same area as is currently under development (resulting in a 5% physical impact). Only about half the area is affected under the low gold price scenario, with a proportional effect on stock levels.

e. The SEIA model does not include international fish credits in the base case results, but does estimate them in a separate section, which are represented in this report as a sensitivity analysis (see Table 2.3.2). In these calculations, incremental impacts are assumed to be 12.5% and 15.0% for the low and high price scenarios respectively. The other models include international fishery impacts directly in the base case benefit/cost results.

f. The SEIA model does not assign any impact of the guidelines to the subsistence freshwater fishery because data on the species mix was not available. The other models are based on Shaffer methodology which uses the mid-point of the range of annual harvests estimated in the SEIA and the same production impacts as for the freshwater commercial fishery (i.e., 7.5% and 10% for the low/medium and high price scenarios respectively.)

g. As previously discussed (note e), the SEIA model does not include Canadian fish credit in the base case benefit/cost calculations. Instead, they are treated as a separate item. Three different levels of Canadian benefits are identified relating to different Canada-US treaty agreements. These are:
   1. the extra harvest is taken by Yukon fishermen;
   2. Alaskans pay compensation for the increment in catch; or
   3. incremental catch taken from the Pacific coast fishery (In this case, the benefits would accrue to Canada, rather than solely to the Yukon.)

   The impact on the value of fisheries benefits are:

treaty arrangement	low price of gold (1983 $ millions)	high price of gold (1983 $ millions)
1.	1.68	1.99
2.	2.46	2.91
3.	4.25	5.03

(assumes a 10% discount rate)

   Shaffer bases the distribution of international fisheries benefits on the currently proposed international agreement for rivers other than the Yukon. Under these conditions, Canada would receive fish credits of 62.5% of total Yukon River stocks which originate in Canada (estimated at 50%). Canadian fish credits, therefore, amount of 50% times 62.5% or 31.25% of any increased Alaskan catch. Sensitivity analyses are performed for higher and lower amounts of credits (see Table 2.3.2).

h. The KPMA report reasons that fisheries benefits accure only as long as the placer mining industry is active or underwrites the costs of compliance. These costs were assumed to last for 13 years in all 4 models. Taking into account the 4-year spawning cycle, the discount period for fisheries is assumed by the KPMA model to be 17 years.

TABLE 2.2.3: ASSUMPTIONS: OTHER SECTORS[a]

Item	SEIA	Shaffer	KPMA	RE Bouse
1. Recreation & tourism	Costs imposed by placer mining noted on those seeking wilderness & outdoor recreation. Value of placer mines as tourist attractions noted		Value of placer mining operations as tourist attractions	"Improvement in or preservation of recreational canoeing and camping facilities to the benefit of the resident and non-resident population."
2. Wildlife preservation	not discussed		not discussed	"Improvement in or conservation of waterfowl and other wildlife stocks. As with fisheries, one would have to give consideration to what impact the improvement in wildlife would have on the fur trapping industry, hunting (commercial and domestic), and tourism."
3. Aesthetic value	not discussed		not discussed	"Improvement in or maintenance of the aesthetics of the environment and the measure to which this factor will contribute to the wellbeing of residents generally and attract tourists."
4. Long run ecological balance	not discussed		not discussed	"Benefits resulting from having an ecologically balanced environment for the long-run future of the area."
5. Historic and cultural preservation	cultural and heritage value of subsistence fishing to Native peoples		Dawson City, placer mining as a vital part of living history and the independent lifestyle of placer miners as important elements in the historical and social fabric of the Yukon.	"Preservation of archeological sites and the value this represents to both the native and non-native populaiton."
6. Administration	not discussed		cost of government control roughly estimated about $119,180/year (not included in BC calculations)	

a. unless otherwise specified, none of these costs or benefits were quantified. None were included in the calculation of net benefits or benefit/cost ratios.

TABLE 2.3.1: SUMMARY OF BASE CASE BENEFIT/COST RESULTS (1983 $ Millions; PV at 10% discount rate)

	SEIA	Shaffer	KPMA	RK House
Benefits	3.16 to 3.90	6.6 to 8.1	2.3 to 2.5	6.6
Costs	30 to 123	11.3 to 40.6	17.8 to 89.4	4.3 to 18.5
Net Benefits	-26.84 to -119.10	-4.7 to -32.5	-15.4 to -87.0	11.7 to -2.3
B/C Ratio	.03 to .11	.20 to .58	.03 to .13	.36 to 1.55
Conclusion	"incremental costs for the placer mining industry ... exceed the corresponding incremental benefits by a factor of at least 5."	"at a 10% discount rate the present value of costs to the placer mining industry exceed the fisheries benefits to Canada."	"the proposed guidelines would in all cases produce significantly negative net benefits, that is, involve net losses to the economy."	"there was a significant improvement in the ratio when foreign withdrawals of net costs are considered at a variety of levels."

Note: The range for base case results estimates in each report is attributable to:

SEIA: variations in gold prices
Shaffer: variations in gold prices
KPMA: variations in gold prices
RK House: variations in production forecasts and variations in foreign withdrawal of net costs (only the medium price forecast is used)

These represent base case B/C results only. Variations arising from sensitivity analyses are detailed in Table 2.3.2.

TABLE 2.3.2: SENSITIVITY TESTS

NOTE: All reported results refer to the medium gold price scenario, except for the SEIA which refer to the low price scenario (results for high gold prices are indicated in parentheses). Benefit/cost ratios are based on the present value of net benefits using a 10% discount rate. The test value refers to the value of an underlying assumption which differs from the base case.

Item	SEIA		Shaffer		KPMA		RK House	
Base Case Benefit/Cost Ratio	.11 (.83)		.41		.88		.41[a]	
Placer Mining Sensitivity	**Test Value**	**B/C Ratio**	**Test Value**	**B/C Ratio**	**Test Value**	**B/C Ratio**	**Test Value**	**B/C Ratio**
1. incremental compliance costs			$28/oz $64/oz (base case: $46/oz)	.57 .32				
2. mining costs			92% (base case: 80%)	.57				
3. decrease in production due to guidelines			28% : (base case: 16%)	.37	85% 0% (base case: 44%)	.87 .87		
4. average output per operation					347 oz (base case: 365 oz)	.87	420 oz (base case: 365 oz)	.49
5. combined sensitivities			(i) 28% decrease in production & costs at 92% of price	.57			(i) 25% withdrawal of net costs and higher average output	.66
Fisheries Sensitivities								
1. Canadian fish credits	Yukon salmon prices[b] Alaska salmon prices Pacific Coast salmon prices	.16 (.85) .19 (.86) .25 (.87)	100% 62.5% 0% (base case: 31.25%)	1.84 .74 .12	100% 62.5% (base case: 31.25%)	.28 .14	combined with other variable changes (see below)	
2. discount period			13 years: (base case: perpetuity)	.28				
3. delay in benefits			4 years: (base case: 0 years)	.28				
4. real annual price changes			0% : 2% : (base case: 1%)	.37 .47				
5. fisheries production forecast	production levels double (base case: no change)	.19 (.86)						
Combined Sensitivities								
1. fish credits & foreign withdrawals of net cost							(i) 62.5% fish credits and 25% withdrawal (ii) 62.5% fish credits & 52% withdrawal (iii) 62.5% fish credits, 25% foreign withdrawal & higher average output	.93 1.43 1.13
2. discount periods					(i) benefits discounted over 34 years; costs over 30 years	.88		

a. The RK House report is presented as a series of sensitivity analyses, with no specific variation identified as a base case. Each sensitivity does, however, represent a variation from Shaffer's base case results which is, therefore, considered the base case for RK House in this table.

b. Calculated by adding the estimates for international fish credits (pg. 174 of the SEIA report) to base case estimates for benefits and recalculating the benefit/cost ratio.

TABLE 2.3.3: COMPARATIVE ESTIMATES OF PRESENT VALUES OF BENEFITS AND COSTS: HIGH GOLD PRICE SCENARIO (1983 Cdn $ millions, 10% discount rate)

Item	SEIA[a]	Shaffer	KPMA	RK House[b]
Cost				
Lost production	93.8	17.1	46.9	12.1-18.5
Incremental Expenditures	30.3	23.5	42.5	16.3-24.2
- settling ponds	6.6	6.3	13.7	
- development plans	0	0	1.2	
- rehabilitation costs	4.8	3.6	4.1	not
- recontouring costs	18.0	12.9	20.2	
- diversions costs	.9	.7	0	specified
- capital costs	0	0	3.3	
Foreign Withdrawal of Net Costs	0	0	0	-21.3-0
Total Costs	123.0[c]	40.6	89.4	7.1-42.7
Benefits				
Commercial	.8	.6	.2	.6
Domestic & Native Food	1.7	.6	.2	.6
Canadian fish credits	0.0	5.5	1.6	5.5
Sport Fishery				
- resident	.4	.5	.1	.5
- non-resident	1.1	.7	.2	.7
Total Benefits	3.9	8.1c	2.5[d]	8.1
Net Benefits	-119.1	-32.5	-87.0	-34.6-1.0
Benefit/Cost Ratio	0.03	0.20	0.03	0.15-1.14

Notes

a. Assumes status quo fisheries scenario

b. Ranges reflect different production function for gold and different levels of foreign withdrawals of net costs. These values were derived from Table 3 in the RK House report. (No B/C ratio for a high gold price scenario was calculated in the report.)

c. Numbers may not add due to rounding.

d. Individual Items do not add to total. Only annual figures were displayed in KPMA report, and we could not successfully reproduce the present value calculation for each of the individual items given the information available. The individual numbers for fish credits, etc., should be viewed therefore as approximations. (The error is $.2 million or 8% of $2.5 million total.)

3.0 COMPARISON OF SOCIOECONOMIC IMPACT ANALYSES

Two of the submissions presented to the Placer Mining Guidelines Public Review Committee -- the SEIA report by the Department of the Environment and the study submitted by the Klondike Placer Mining Association -- present descriptions of the Yukon placer mining and fisheries industries and analyze the socioeconomic impacts (also referred to as "non-allocative effects" and "secondary effects" in the reports and the tables overleaf) of the guidelines. (The difference between this approach and benefit-cost analysis is briefly discussed in Section 4.)

The purpose of this section is to present the differences in the estimates of impact effects of the guidelines at the territorial level as reported in the SEIA and KPMA studies. These effects include loss in direct, indirect, and induced[1] employment in the placer mining industries and foregone direct, indirect, and induced income generated from that industry. The SEIA study also reports estimates of employment gains due to higher levels of harvestable fish stocks. This section does not deal with the more general discussion of the current structure and importance of the placer mining and fishery industries except in the context of impact estimates.

This section is organized in the same manner as the comparative analysis for the benefit-cost studies -- data sources and assumptions for each item are noted in Table 3.1, supplemented by a summary of "bottom line" estimates of the employment and income impacts in Table 3.2.

The considerable differences in data, assumptions, and methodology which exist between the SEIA and KPMA reports limit the value of comparing the two sets of impact estimates shown in Table 3.2. Two of the most fundamental discrepancies are:

. Assumptions regarding the reduction in gold production with the introduction of the mining guidelines. The SEIA assumes a 16% decrease, while the KPMA report uses an 85% figure. (It should also be noted that the impact estimates from the KPMA do not correspond to their benefit-cost base case which uses a less stringent assumption of 44%.)[2]

. Estimation methodology. The KPMA report provides rough impact figures calculated from current income and employment levels in the placer mining industry. For example, loss in direct income is calculated as 85% (the assumed reduction in production) of the 1982 value of the industry, which is estimated at $48.3 million. By contrast, the SEIA impact estimates are based on forecasts of mining revenue (income) and employment. This methodology results in two different scenarios for impact effects related to high gold price and a low gold price assumptions in the SEIA report, but not in the KPMA report.

FOOTNOTES

1. Direct employment refers to people directly employed in placer mining.
Indirect employment/income refers to employment/income created in other sectors that supply goods and services to the placer mining industry.
Induced employment/income refers to employment/income created by the consumption spending of both direct and indirect employees.

2. The 44% figure reflects the number of firms which would have to comple with the 0mg/l or 100mg/l standard, but does not include an estimated 41% of companies who face the 1000mg/l standard, but could be forced out of the industry due to high compliance costs.

TABLE 3.1: SUMMARY OF PRINCIPAL ASSUMPTIONS AND DATA SOURCES FOR IMPACT EFFECTS

Sector and Item	SEIA	KPMA
Mining		
employment loss direct	**assumptions** . baseline data: low gold price scenario employment equals 125 - 150 man-years; high gold price scenario employment equals 300-350 man-years. . employment losses are assumed to be directly proportional to reduction in the number of operators (e.g., 16%) **source** . historical data on gold prices & employment levels	**assumptions** . 1982 employment: 650 jobs or 298 man-years . employment losses are assumed to be directly proportional to reduction in the number of operators (e.g., 85%) **source** . Debicki (1983);[a] KPMA; Water Resources, DIAND; ERPB
indirect/induced	**assumptions** . regional multiplier = 1.5[b] **source** . Government of Yukon, Economic Research & Planning Branch	**assumptions** . regional multiplier = 2.0[b] **source** . ERPB personal communication (1983) in comparison with numerous other reports including Debicki (1983), Cyprus Anvil (1983); BC-MISRD (1981), Berger (1983), Centre for Resource Studies (1978).
Fisheries		
employment gain	**assumptions** . baseline data: current employment equals 700-950 seasonal jobs including assistance from family members . the status quo scenario implies employment levels would be maintained in the absence of the guidelines	not applicable

... continued

TABLE 3.1: SUMMARY OF PRINCIPAL ASSUMPTIONS AND DATA SOURCES FOR IMPACT EFFECTS (continued)

Sector and Item	SEIA	KPMA
	. employment with guideline increases in direct proportion to catch level (&, therefore, to physical impact of the guidelines on stock levels). For sport fisheries, a 5% decline in catch results in a 1% decline in tourist expenditures & related employment. **sources** : not specified	

a. see KPMA Report for full bibliographies.

b. e.g., a multiplier of 1.5 (2.0) implies that $1 in direct income from placer mining activity will be an additional $.50 ($1) in indirect and induced, for a total income effect of $1.50 ($2.00).

TABLE 3.2: SUMMARY OF IMPACT EFFECTS[a] (ESTIMATED)

Sector and Item	SEIA[b]		KPMA[c]
	low gold price	high gold price	
Mining			
employment loss (annual man-years)	30-36	72-84	508
direct	20-24	48-56	254
indirect/induced	10-12	24-28	254
income loss (annual loss in 1983 $ millions)			
direct	2.2	13.2	30.2
indirect/induced	.9	5.3	10.9[d]
Fisheries			
employment gain (number of seasonal jobs)	45-66	58-81	not specified[e]

a. Shaffer and RK House did not discuss socioeconomic impact effects. Impact effects refer to impacts on the Yukon economy.
b. SEIA estimates correspond to the status quo fisheries scenario. Annual income loss figures were derived from present value estimates in Tables 6.1, 6.2, and 6.3.
c. KPMA estimates are based on the current state of placer mining industry rather than production forecasts used in the benefit/cost calculations. It should also be noted that effects are based on the asumption that 85% of operations (vs 16% as in the SEIA model) leave the industry.
d. calculated from Table 7.4-4
e. The KPMA report suggests that the SEIA's estimates of expected employment benefits from fisheries protection (and consequent increased catch) are optimistic. No revised estimtes are, however, calculated.

4.Ø GENERAL ISSUES OF ECONOMIC METHODOLOGY

A number of points concerning economic methodology were raised during the question and answer portion of the hearings which generated legitimate problems of interpretation for those involved. We thought it would be useful to the Panel to clarify some of the issues which appeared frequently in the transcripts. It should be emphaiszed that these are general concerns which are not confined to any particular submission.

Difference between socioeconomic impact assessment and benefit-cost analysis.

There are important differences between these two types of economic analysis. A socioeconomic impact assessment attempts to estimate the gross impact of an economic development or government policy on a community, region, or national economy.

A typical socioeconomic impact assessment for a major project focuses on employment and income gains (losses) and their effects on population, community services, housing and municipal infrastructure, municipal finance, land and water use, and quality of life factors. A socioeconomic impact assessment focuses not only on the direct employment gains (losses), but also on the indirect effects that would occur due to employment gains (losses) in the sectors that provide goods or services to the affected industry and the induced effects that would occur because of the increased (reduced) spending by the affected employees, in- or out-migration, etc. An economic multiplier is commonly used to estimate these indirect and induced effects.

Benefit-cost analysis (B/C) is a technique used to compare the "net" returns or gains to a given society as the result of a certain project or policy measure. According to benefit-cost criteria, society will be better off as a result

of a particular policy or project if the expected benefits from that policy or project are greater than the expected benefits from the best alternative use of the same resources. When federal regulations and agencies are involved, Canada is usually the "society" from whose perspective the analysis is conducted.

B/C analysis differs from socioeconomic impact assessments in its treatment of impacts such as employment losses. In B/C analysis, labour is viewed as a mobile resource that can be employed in a multitude of alternative economic activities. For example, miners who become unemployed are viewed as employable in alternative pursuits within Canadian society. However, socioeconomic impact assessments for the Yukon would view such job losses as a negative impact.

The treatment of non-quantified benefits and costs in an SEIA or B/C analysis.

One of the central problems in socioeconomic impact assessment and B/C analysis is how to treat benefits or costs which by their nature are hard to measure (e.g., impacts on aesthetics, wildlife conservation) or for which insufficient data exist (e.g., the extent of foreign withdrawal of earnings from the placer mining industry). In each case, the analyst attempts to assign some reasonable estimate of value or to describe the likely effects of the benefit or cost in qualitative terms.

Ultimately, many of these problems of valuation can only be resolved by political decisions which, hopefully, reflect society's evaluation of the costs and benefits which are not easily measured in money terms. The inability to value certain benefits and costs should not rule out the usefulness of B/C analysis as an aid to decision-makers. A proper B/C analysis can not only provide a sound basis for a decision -- it can also permit an estimate to be made of the values that would have to be attached to non-quantifiable benefits and

costs in order to justify a particular project or policy.

The appropriate "referent group" for economic analysis -- Yukon or Canada.

Considerable discussion during the hearings focussed on whether economic analysis (both socioeconomic impact assessments and B/C analysis) should look at the impact of placer mining guidelines from the perspective of Canada or the Yukon. It is possible to adopt either a territorial or national perspective for either a socioeconomic impact assessment or B/C analysis. The methodologies would be applied in a similar fashion. A number of adjustments would be required in doing a territorial analysis to include only those benefits and costs that accrue to an individual, institution, or agency living and operating within the Yukon territorial boundaries. All B/C analyses were undertaken in accordance with the federal Treasury Board Guidelines for Benefit-Cost Analysis, which specifically require all of Canadian society to be the referent group for the analysis. The analysis of socioeconomic impacts (or secondary effects) in the SEIA and KPMA reports were largely done from the perspective of the Yukon territory (i.e., territory multipliers were used). The choice of relevant jurisdiction for the analysis ultimately depends on the perspective of the decision-maker.

Incremental costs as basis for socioeconomic impact assessment and B/C analysis.

Both SEIA and B/C analysis are concerned with increases (decreases) in costs and benefits that would occur as a result of the project or policy over and above what would occur in the absence of the project or policy. This is the only way to isolate the impact of a project or policy measure. With mining, for example, the analyst is only interested in the additional or incremental costs that would occur as the result of the mining guidelines. The KPMA

report was questioned by intervenors as to whether incremental costs related to compliance had been correctly treated. The issue had not been satisfactorily resolved at the time of this report, and a detailed investigation of the issues was not part of our terms of reference.

5.0 Summary Review and Comments

To complement the tables in Section 2, this section provides a summary review of the main sources of difference between then four studies under their base case scenarios. Differences under the two main categories of mining costs and fisheries benefits are discussed below, followed by some concluding comments.

Mining Costs

Level of compliance expenditures. The level of compliance expenditures imposed on the remaining operators in the industry is one of the most important and sensitive assumptions in the benefit-cost analyses.

KPMA has calculated significantly higher compliance expenditures compared to the original SEIA work. KPMA's estimated higher expenditures can be attributed to a number of factors. Different engineering assumptions were used with respect to bulldozer efficiency and settlement times. Higher average flow rates were assumed in calculating settling pond construction costs. The costs of development plans were also included in the KPMA estimates. In addition, considerable controversy existed during the hearings as to whether KPMA had correctly estimated incremental costs, and whether some double-counting had occurred in their computation of compliance costs. The issue had not been resolved at the time of our work.

Percent of operators forced to leave the industry as a result of the guidelines. KPMA assumed that 44% of the existing operators would be forced out of business due to compliance with the guidelines. SEIA and Shaffer assumed a 16%-28% range. RK House used the SEIA/Shaffer attrition figures, but adjusted estimates of actual production lost (in one sensitivity test) because of assumed higher average productivity of the remaining operators. The SEIA/Shaffer

attrition rates were based on the use of a physical risk model, the KPMA assumptions on the argument that only operators having to meet the 1000 mg/litre standard would remain in business.[1]

None of these assumptions was based on a detailed financial analysis. Ideally, an assessment of the impact of guidelines on operators would involve the development of financial profiles of revenues and costs for various classes of operators in the industry, according to profitability levels. The classification of operators according to profitability, together with the assumed costs of compliance would have indicated the number of operators who could financially afford to remain in the industry. Gathering sufficient unbiased information from operators to carry out such analysis is a formidable task -- this was likely the reason it was not attempted by any of the analysts given timing and resource constraints.

Gold production forecasts. All analysts except RK House used the gold production forecasts developed in the SEIA report. House criticized the SEIA production forecast equation because it ignored possible impacts of accumulated gold stocks and a consideration of marginal costs-marginal revenue relationships.

To test the reasonableness of the SEIA formulation, two alternative equations were formulated using the same SEIA data: different production level estimates resulted. These production forecasts were used along with the SEIA estimates to perform the benefit-cost analysis.

Foreign withdrawal of net revenues from the placer mining industry. Both Shaffer and RK House acknowledged that the distribution of Canadian and US costs in the mining industry should be taken into account in calculating net benefits accruing to Canada. (This is consistent with Treasury Board guidelines which require Canadian society to be the referent

group.) Data limitations precluded anything more than a qualifying statement by Shaffer which accompanies his conclusions. KPMA also did not make any comments or adjustments to their results based on this issue. RK House arbitrarily picked three possible scenarios (25%, 50%, and 75% withdrawal of net revenues) in a set of sensitivity tests.

Fisheries Benefits

Timing and duration of fish benefits. The SEIA study and Shaffer assumed that fish production benefits (due to rehabilitation and habitat protection) would begin accruing immediately after the imposition of the guidelines. They also assumed they would accrue in perpetuity due to the renewable nature of the resource. KPMA assumed that fish production from rehabilitation measures would lag four years, consistent with the average length of the spawning cycle for freshwater and salmon species. In addition, habitat protection benefits were delayed 14 years, based on an additional delay of 10 years before new areas would be exploited for placer mining activity. KPMA also assumed that the duration of benefits would only be 17 years.

Valuation of sport fishing benefits. Shaffer uses a higher estimate of both domestic and non-resident sport fishing benefits than is assumed in the SEIA report. In the case of resident sport fishermen, a slightly higher measure of net value per angler day was used based on a review of recent studies. In the case of non-resident impacts, higher estimates of net economic values were based on an "income" rather than an "expenditure" approach to valuation. KPMA and RK House adopted the Shaffer values in their work.

Concluding Comments

1. All analysts cited data unavailability as a significant constraint in valuing benefits, costs, and impacts.

In spite of this, the overwhelming majority of benefit-cost analyses (including sensitivity tests) from the four reports generated benefit-cost ratios less than one. The common conclusions from the four reports was that costs to the placer mining industry in terms of compliance costs and lost production would exceed the fisheries benefits in all but a few cases.

A benefit-cost ratio higher than one occurred only in scenarios where higher Canadian fish credits were combined with assumed foreign withdrawals of net placer mining revenues and/or higher assumed average output of remaining operators after guideline imposition.

2. The level of compliance costs is one of the most significant factors affecting the benefit-cost results in each of the reports. SEIA, Shaffer, and KPMA have quite divergent assumptions on what the actual level of incremental expenditures would be to conform to the guidelines. The importance of compliance costs to the overall benefit-cost results points to the potential value of additional research to develop more definitive compliance costs estimates. In addition, further examination of modified or alternative guideline standards might yield an economically feasible set of guidelines which woule lie somewhere between the proposed and existing set of standards.

3. All benefit-cost analyses were carried out with Canadian society as the referent group. Given the required adjustments to costs and benefits, smaller benefit-cost ratios would result if a Yukon perspective has been adopted.

4. Conventional benefit-cost analysis assumes a different economic perspective from socioeconomic impact analysis. Benefit-cost analysis concentrates on changes in net values (revenues minus costs) of industry output. For

example, labour inputs are viewed as simply a component of cost in computing the net contribution of an industry to the economy. They are assumed to be mobile resources which alternatively can be employed in some other economic sector within the country.

Socioeconomic impact analysis, on the other hand, views jobs, wages and salaries, and industry purchases from other sectors as benefits or positive impacts for a particular region or community.

This distinction is an important one. It explains why industry and territorial residents would view the potential loss of jobs and wage income due to the imposition of guidelines as a serious negative consequence, and benefit-cost analysis would consider only the net value of output costs and compliance costs as overall economic costs to Canadian society.

FOOTNOTES

1. In an earlier section of the KPMA report, impact effects based on an attrition figure of 85% were estimated. This 85% figure was estimated in two steps. First, all companies which had to comply to the Omg/l levels were assumed to shut down. This represents 44% of the number of operations. Second, physical and/or financial constraints (i.e., compliance costs in excess of profit levels) would prevent an additional group of companies from complying with the 1000mg/l standard. This brought the attrition estimate up to 85%. In calculating the B/C results, however, the more conservative figure of 44% was used.

APPENDIX F

LIST OF REFERENCE MATERIAL USED BY THE COMMITTEE

REFERENCE MATERIAL USED BY THE COMMITTEE

LEGISLATION

Northern Inland Waters Act & Regulations

Yukon Placer Mining Act & Regulations

Fisheries Act - Sections that Apply to Mining

Yukon Act

B.C. Ministry of Energy & Mines & Petroleum Resources
(see info given to miners re: application requirements classification)

Alaska

i) Annual Placer Mining Application
ii) Preliminary Findings Placer Mining Task Force - March 1983
iii) Other Related Information

Yukon Placer Mining Operating Guidelines and Conditions
Amended - March 1976

MINUTES OF MEETINGS

Government/Industry Meeting on Placer Mining
January 19, 1982 - February 18,19, 1982

Yukon Water Board - Public Hearings

August 10, 1979
September 7, 1979
September 20, 1979

Yukon Water Board - Public Hearings #2

October 25, 1979

BOOKS

How to Make Meetings Work - Doyle, Michael
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The Gold Hustlers - Green, Lewis

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REFERENCE MATERIAL USED BY COMMITTEE CONTINUED

REPORTS

Guidelines for Reclamation of Placer Mining Operations - Klondike Region - April 4, 1979 (Report for Y.T. Water Board - prepared by R.M. Hardy & Associates Ltd.).

Fish and Wildlife Habitat Recovery in Placer Mined Areas of Yukon prepared for DIAND by Hardy & Associates

Acquatic & Wildlife Resources of Seven Yukon Streams Subject to Placer Mining - September 1981 - Mathers, J.S., West, N.O., Burns, B.

Water Use Technology for Placer Mining Effluent Control - 1981 (produced for DIAND by Sigma Resources Consultants Ltd.)

A Handbook for Fish Habitat Protection on Forest Lands in British Columbia - Toews, D.A.A., Brownlee, M.J.

An Annotated Bibliography & Information Summary on the Fisheries Resources of the Yukon River Basin in Canada - June 1982.

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Guidelines for Land Development & Protection of the Aquatic Environment - Fisheries and Marine Service - July 1978.

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REFERENCE MATERIAL USED BY COMMITTEE CONTINUED

REPORTS CONTINUED

A Rationale for the Suspended Solids Standards for Yukon Streams Subject to Placer Mining - February 1983.

A British Columbia Stream Habitat & Fish Population Inventory System - October 1981 - DeLeeuw, A.D.

Effects of Sedimentation on Salomid Stream Life - June 1980, Langer, Otta, E.

A Review & Resolution of Fish Passage Problems at Culvert Sites in British Columbia, Dane, B.G. - September 1978.

Fish Screening Specifications

Yukon Placer Mining - A Position Paper - December 1981

Rationale for the Principles for Placer Mining Industry Guidelines in Yukon (KPMA-1982).

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KPMA Wildlife Studies 1980 - A comparative Study of the Use of Disturbed and Undistrubed Areas by Wild Vertebrates in the Klondike, Yukon Territory with Recommendations for Placer Mining Reclamation Practice - Prepared for Klondike Placer Miners Association by C.C. Hawley and Associates Canada Ltd. June 30, 1981.

A Study of Mercury Usage in Placer Mining Operations in Yukon Territory and Northwestern British Columbia - Prepared for Environment Canada, by Tim R. Osler - February 1983.

Yukon River Basin Study Project Report: Placer No. 1 Placer Mining Industry in Yukon and Atlin Mining Division, B.C. by: R.L. Debicki - February 1983.

Fisheries & Oceans
- Annual Report 1980
- Annual Report 1981
- Annual Narrative Report Alsek/Taku Sub-District 1980
- Annual Narrative Report Alsek/Taku Sub-District 1981
- Annual Narrative Report Alsek/Taku Sub-District 1982
- Annual Narrative - Yukon Arctic Sub-District 1980
- Annual Narrative - Yukon Arctic Sub-District 1981
- Annual Narrative - Yukon Arctic Sub-District 1982

REFERENCE MATERIAL USED BY COMMITTEE CONTINUED

REPORTS CONTINUED

A biological and Water Quality Assessment at a Placer Mine on Little Gold Creek, Yukon Territory - Regional Program Report No. 83-06 Environment Canada Environmental Protection Service.

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A Brief History of Placer Mining in the Yukon - by Gilbert, G.W. Mining Claims Inspector for the Department of Indian and Northern Affairs in Yukon (Published under the authority of the Hon. John C. Munro, Minister of Indian and Northern Affairs Canada, Whitehorse, 1981) QS-Y002-000-EE-A1.

Mines and Mineral Activities 1981 - Northern Affairs Program (Published under the authority of the Hon. John C. Munro, P.C. M.P., Minister of Indian Affairs and Northern Development, Ottawa, 1982) QS-8309-000-EE-A1.

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Transcript - Public Hearing # 2 - Interim Placer Mining Guidelines - September 20, 1979, Whitehorse, Yukon Territory for Yukon Territory Water Board

REFERENCE MATERIAL USED BY COMMITTEE CONTINUED

REPORTS CONTINUED

Transcript - Public Hearings # 3 - Interim Placer Mining Guidelines - October 25, 1979, Whitehorse, Yukon Territory for Yukon Territory Water Board

Interim Guidelines for the Issuance of Authorizations to Use Water for the Purpose of Placer Mining in the Yukon Territory, August 10, 1979 for Yukon Territory Water Board.

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State of Art of Stream Monitoring. Virginia Highway and Transportation Research Council. VHTRC 81-R. Charlottesville, Virginia, March, 1981, pp.52.

POOR

QUALITY

ORIGINAL